STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 062004-005 Project Number: 2000-05-077

Owner: Holcim (US) Inc.

Owner's Address: 210 Jones Road
Waltham, MA 02451

Installation Name: Holcim (US) Inc. – Lee Island Project

Installation Address: 2942 US Highway 61
Bloomsdale, MO 63627

Location Information: Ste. Genevieve, Ste. Genevieve County, Township 9 & 10, 39N, 7E39N, Range 7E, Sections 9 & 10

Application for Authority to Construct was made for:

This construction permit and NESHAPS approval is for a Portland Cement Manufacturing installation that includes a cement manufacturing plant, quarry and coal preparation plant. The review was conducted in accordance with Section (8), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, and 40 CFR Part 63, *National Emission Standards for Hazardous Air Pollutants for Source Categories*, subsection 5(e).

☐ Standard Conditions (on reverse) are applicable to this permit.

☑ Standard Conditions (on reverse) and Special Conditions (listed as attachments starting on page 2) are applicable to this permit.

JUN - 8 2004

EFFECTIVE DATE

Leanne Tippitt

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must notify the Department of Natural Resources Regional Office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed Special Conditions as provided in RSMo 643.075. If you choose to appeal, the Air Pollution Control Program must receive your written declaration within 30 days of receipt of this permit.

If you choose not to appeal, this certificate, the project review, your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Department of Natural Resources has established the Outreach and Assistance Center to help in completing future applications or fielding complaints about the permitting process. You are invited to contact them at 1-800-361-4827 or (573) 526-6627, or in writing addressed to Outreach and Assistance Center, P.O. Box 176, Jefferson City, MO 65102-0176.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention Construction Permit Unit.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit are included based on the authority granted the Missouri Department of Natural Resources by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific content details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10., "Conditions required by permitting authority."

Definitions of certain terms or phrases used in this permit and report may be found in 10 CSR 10-6.020, "Definitions and Common Reference Tables".

Definition: 12-month rolling average – the arithmetic mean of the most recent 12 monthly averages; or, the total of the monthly arithmetic averages of the samples of the complete months available divided by 12, when there are less than 12 monthly averages available. A new limit or change of limit initiates a new rolling average period.

Definition: 30-day rolling average – the arithmetic mean of the most recent 30 daily averages; or, the total of the daily arithmetic averages of the samples of the complete days available divided by 30, when there are less than 30 daily averages available. A new limit or change of limit initiates a new rolling average period.

Definition: Emission Reduction Credit (ERC) – as defined by federally approved state rule 10 CSR 10-6.410, "Emission Banking and Trading", and the procedures contained within this rule for generation, use and retirement.

All tons are in U.S. measurement units (short tons).

All values are specified to the significant digit. The rounding convention used in this permit is:

- *If the least significant digit is less than 5, then the remaining numeral stays the same.*
- *If the least significant digit is equal to or greater than 5, then the remaining numeral is adjusted up to the next larger value.*

Unless otherwise specified, all days are numbered according to calendar days.

Refer to Table 3, "Holcim (US) Inc. - Lee Island, Applicability Table" attached to the permit report for a listing of the emission points, emission units and the applicable standards.

Refer to Appendix A of the permit report for a listing of acronyms.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

(1) General Requirements:

(A) Holcim (US) Inc. (hereafter in the special conditions referred to as "permittee") shall prepare, implement and comply with a written operation and maintenance plan for all sources and controls identified in this permit, including the PCMACT sources identified in special conditions (7)(E)3.B. The permittee shall make this operation and maintenance plan available for inspection by department personnel when requested.

(B) Record Keeping Retention - The permittee shall maintain all records required by this permit for not less than five (5) years and shall make them available immediately to any department personnel upon request.

(C) The permittee shall update and maintain all 12-month rolling averages no later than ten (10) days after the end of a month.

(D) The permittee shall report any deviation from an emission limitation contained in this permit. The report shall be sent to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten (10) days after the end of the month during which deviation occurs.

(E) The permittee shall submit a "Quality Assurance Stack Testing Protocol" no less than thirty (30) days in advance of conducting any stack testing for staff director review and approval.

(F) The permittee shall use only the appropriate test methods identified in 10 CSR 10-6.030, "*Sampling Methods for Air Pollution Sources*". The permittee may use an alternative method provided the permittee submits a written request, which the staff director approves in advance for use.

(G) This permit may be reopened with cause if:

1. The department determines that this permit contains a material mistake or that inaccurate statements were made and used as the basis for establishing the emissions limitation standards or other terms of the permit,
2. The department determines that the permit must be reopened and revised to assure compliance with applicable law that would not otherwise (other than this construction permit) be dealt with.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

(H) Severability Clause - In the event of a successful challenge to any part of this permit, all uncontested permit conditions shall continue to be in full force and effect. All terms and conditions of this permit remain in effect pending any administrative or judicial challenge to any portion of the permit. If any provision of this permit is invalidated, the permittee shall comply with all other provisions of the permit.

(I) The permittee must comply with all of the terms and conditions of this permit. Any noncompliance with a permit condition constitutes a violation and is grounds for enforcement action, permit revocation and re-issuance or permit modification.

(J) The permittee may not use as a defense in an enforcement action that it would have been necessary for the permittee to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.

(K) The filing of an application or request for a permit modification, revocation and re-issuance, or anticipated noncompliance, will not stay any permit condition.

(L)The permittee shall furnish to the department, upon receipt of a written request and within a reasonable time, any information that the department may require to determine whether cause exists for modifying, reopening or revoking the permit or to determine compliance with the permit. Upon written request, the permittee also shall furnish to the department copies of records required to be kept by the permittee. The permittee may make a claim of confidentiality for any information or records submitted pursuant to 10 CSR 10-6.210.

(M) Compliance Requirements

1. Any document (including reports) required to be submitted by the permittee shall contain a certification signed by a responsible official.
2. Upon presentation of credentials and other documents as may be required by law, the permittee shall allow authorized representatives of the department, or its authorized agents, to perform the following (subject to the permittee's right to seek confidential treatment of information submitted to, or obtained by, the department):
   A. Enter upon the premises where a permitted installation is located or an emissions-related activity is conducted, or where records must be kept under the conditions of this permit;
   B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

C. Inspect, at reasonable times and using reasonable safety practices, any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and

D. As authorized by the Missouri Air Conservation Law, Chapter 643, RSMo., sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with the terms of this permit, and all applicable requirements as outlined in this permit.

(N) Emergency Provisions - An emergency or upset as defined in 10 CSR 10-6.065(6)(C)7. shall constitute an affirmative defense to an enforcement action brought for noncompliance with technology-based emissions limitations. To establish an emergency- or upset-based defense, the permittee shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence, the following:

1. That an emergency or upset occurred and that the permittee can identify the source of the emergency or upset,
2. That the installation was being operated properly,
3. That the permittee took all reasonable steps to minimize emissions that exceeded technology-based emissions limitations or requirements in this permit, and
4. That the permittee submitted notice of the emergency to the department within two working days of the time when emission limitations were exceeded due to the emergency. This notice must contain a description of the emergency, any steps taken to mitigate emissions, and any corrective actions taken.
5. An emergency or upset shall not include noncompliance caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

(O) Continuous Emission Monitoring Systems –state or federal regulations shall be followed where they apply. In the absence of other, more appropriate specifications, the following shall be used:

1. The permittee shall install, calibrate, maintain, and operate a continuous emission monitoring system (CEMS) where required to measure and report emissions in the units of measure of the applicable standards. The permittee shall make any additional measurements necessary to report the data in terms of the applicable standards, which may include hourly exhaust flow rates and total amount of clinker produced.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

2. The permittee shall install, calibrate, maintain, and operate a continuous emission monitoring system (CEMS) for measuring the opacity of the emissions discharged to the atmosphere and record the output of the system. The system shall be designed to meet the 40 CFR 60, Appendix B, Performance Specification 1 (PS1). The permittee shall install, calibrate, maintain, and continuously operate a continuous monitor to record the temperature of the exhaust gases from the kiln at the inlet to or upstream of the kiln particulate matter control device In accordance with NESHAP Subpart LLL [40 CFR §63.1350(f)]. Per 40 CFR §63.1350(f), the following shall be done:
   A. The recorder response range must include zero and 1.5 times either of the average temperatures established according to the requirements in 40 CFR §63.1349(b)(3)(iv).
   B. The reference method must be a National Institute of Standards and Technology calibrated reference thermocouple-potentiometer system or alternate reference, subject to approval by the director.
   C. The three-hour average temperature shall be calculated as the average of 180 successive one-minute average temperatures.
   D. Periods of time when one-minute averages are not available shall be ignored when calculating three-hour rolling averages. When one-minute averages become available, the first one-minute average is added to the previous 179 values to calculate the three-hour rolling average.
   E. The calibration of all thermocouples and other temperature sensors shall be verified at least once every three months.
3. The permittee shall install, calibrate, maintain, and operate a CEMS for measuring sulfur dioxide emissions discharged to the atmosphere and record the output of the system. The system shall be designed to meet the 40 CFR 60, Appendix B, Performance Specification 2 (PS-2) and Performance Specification 6 (PS-6) requirements. The specifications of 40 CFR Appendix F (Quality Assurance/Quality Control) shall apply. Appendix F requirements shall be supplemented with a quarterly notice to the department with the dates of the quarterly cylinder gas audits and annual relative accuracy test audit.
4. The permittee shall install, calibrate, maintain, and operate a CEMS for measuring nitrogen oxides emissions discharged to the atmosphere and record the output of the system. The system shall be designed to meet the 40 CFR 60, Appendix B, Performance Specification 2 (PS-2) and Performance Specification 6 (PS-6) requirements. The specifications of 40 CFR Appendix F (Quality Assurance/Quality Control) shall apply.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Appendix F requirements shall be supplemented with a quarterly notice to the department with the dates of the quarterly cylinder gas audits and annual relative accuracy test audit.

5. The CEMS required by this permit shall be operated and data recorded during all periods of operation of the kiln except for CEM breakdowns and repairs. Data is recorded during calibration checks, and zero and span adjustments.
6. The 1-hour average sulfur dioxide and nitrogen dioxide emission rates measured by the CEMS required by this permit shall be used to calculate compliance with the emission standards of this permit. At least two (2) data points must be used to calculate each 1-hour average.
7. For each hour of missing emission data (NO_x or SO_2), the owner or operator shall substitute data using the following method:
   A. If the monitor data availability is equal to or greater than 95.0%, the owner or operator shall calculate substitute data by means of the automated data acquisition and handling system for each hour of each missing data period according to the following procedures:
      (I) For a missing data period less than or equal to 24 hours, substitute the average of the hourly concentrations recorded by an pollutant concentration monitor for the hour before and the hour after the missing data period.
      (II) For a missing data period greater than 24 hours, substitute the greater of:
         (a) The 90th percentile hourly concentration recorded by a pollutant concentration monitor during the previous 720 quality-assured monitor operating hours; or
         (b) The average of the hourly concentrations recorded by a pollutant concentration monitor for the hour before and the hour after the missing data period.
   B. If the monitor data availability is at least 90.0% but less than 95.0%, the owner or operator shall calculate substitute data by means of the automated data acquisition and handling system for each hour of each missing data period according to the following procedures:
      (I) For a missing data period of less than or equal to 8 hours, substitute the average of the hourly concentrations recorded by a pollutant concentration monitor for the hour before and the hour after the missing data period.
      (II) For the missing data period of more than 8 hours, substitute the greater of:

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

(a) The 95th percentile hourly pollutant concentration recorded by a pollutant concentration monitor during the previous 720 quality-assured monitor operating hours; or

(b) The average of the hourly concentrations recorded by a pollutant concentration monitor for the hour before and the hour after the missing data period.

C. If the monitor data availability is less than 90.0%, the owner or operator shall obtain actual emission data by an alternate testing or monitoring method approved by the department.

(P) Initial Performance Testing Requirements

1. The permittee shall verify compliance with the emission limitations contained in this permit within sixty (60) days after achieving maximum production rate and no later than one hundred eighty (180) days after the initial startup date of the proposed equipment. The unit(s) being sampled should be operated in a normal manner at maximum continuous output as rated by the equipment manufacturer, or the rate specified by the permittee as the maximum production rate at which this unit(s) will be operated. In cases where compliance is to be demonstrated at less than the maximum continuous output as rated by the manufacturer, and the permittee's intent to limit the capacity to that rating, the permittee may submit evidence to the department that this unit(s) has been physically altered so that capacity cannot be exceeded, or the department may require additional testing, continuous monitoring, reports of operating levels, or any other information deemed necessary by the department to determine whether this unit(s) is in compliance.
2. Each emissions compliance test must be approved by the department. Unless otherwise specified by rule or regulation, each test shall consist of three separate runs. The duration of each run shall be established by the department in the Stack Testing Protocol. The arithmetic mean of three acceptable test runs shall apply for compliance, unless otherwise indicated.
3. A pretest meeting shall be held at a mutually agreeable site no less than fifteen (15) days prior to the date of each test. Department representatives shall attend this meeting, along with the permittee and the testing firm, if any. It shall be the responsibility of the permittee to coordinate and schedule the pretest meeting. The permittee shall be responsible for the installation and maintenance of test ports. The department reserves the right to impose additional, different, or more detailed testing requirements through the Stack Testing Protocol.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

(2) Standards of Performance for Best Available Control Technology (BACT)

(A) Particulate Matter less than 10 microns in diameter (PM_{10}) [BACT]

1. Baghouse conditions

A. The permittee shall control particulate matter emissions from the emission units listed on attachment "Fabric Filter Listing", using baghouses.

B. The permittee shall not emit more than 0.010 grains per dry standard cubic foot (DSCF) of particulate matter from any baghouse with the exception of emission points 49, 50 and 115. The permittee will test at least ten percent (10%) of the baghouses subject to this emission limitation for compliance demonstration. All baghouses tested must demonstrate compliance or corrective action is required, to include testing the remaining baghouses.

C. The permittee shall not emit more than 0.28 pounds of PM_{10} per ton of clinker from either emission point 49 or 115. The permittee will demonstrate compliance through appropriate stack testing.

D. The permittee shall not emit more than 0.07 pounds of PM_{10} per ton of clinker from emission point 50. The permittee will demonstrate compliance through appropriate stack testing.

E. The permittee shall monitor baghouse performance according to the appropriate regulatory authority. If no monitoring protocol has been specified by an appropriate regulation, then the permittee shall use the PCMACT monitoring requirement.

2. Quarry Haul Roads Requirement.

A. The permittee shall control the emission of PM_{10} from the quarry haul road(s) [all traffic, east quarry traffic, west quarry traffic, modeling emission points (EP) number 4 and emission unit (EU) numbers 1, 2 and 3] so as to achieve 90% control of PM_{10}.

B. The permittee shall develop a site specific watering and chemical dust suppressant control plan to achieve 90% control of PM_{10}. The site specific watering and chemical dust suppressant control plan will at least consider the following:

(I) The affect of the temporally varying evaporation rate on the road surface moisture content;

(II) The affect of traffic volume on the road surface moisture content;

(III) The affect of various water quantity and frequency rates on the road surface moisture content.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

C. The permittee will submit the site specific watering and chemical dust suppressant control plan to the department for review and approval 180 days prior to commencing operations at the quarry plant.

D. The permittee will implement the approved site specific watering and chemical dust suppressant control plan prior to commencing operations at the quarry plant.

E. The permittee will use EPA's document, Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, to develop the site specific watering and chemical dust suppressant control plan. The permittee will follow the guidelines in chapter 13.2.2 Unpaved Roads when developing the site specific watering and chemical dust suppressant control plan. This includes using Appendices C.1 and C.2 to AP-42.

3. Plant Haul Road Requirements – Paving, Washing and/or Watering - [gypsum delivery traffic, cement loadout traffic, general traffic, flyash delivery traffic, general traffic, modeling emission points (EP) number 1 and emission unit (EU) numbers 1 through 5]

A. The permittee shall control PM_{10} from the plant haul road(s) by paving the roads. The permittee shall pave the affected plant haul road(s) within thirty (30) days after the commencement of the plant's operations at this site. The department may extend the 30-day deadline to pave the plant haul road(s). The permittee shall inform the department, in writing within fifteen (15) days, of the date when the permittee commences operation at this site and the date when the permittee has completed paving of the affected plant haul road(s).

B. The permittee will pave the plant haul road(s) in accordance with industry standards for such pavements.

C. The permittee will maintain and repair of the road surface as necessary to ensure that the physical integrity of the pavement is adequate to restore the pavement to the industry standards for such pavements.

D. The permittee shall periodically water and wash the paved portions of the above affected plant haul road(s) such that no fugitive particulate matter emissions remain visible in the ambient air beyond the property line of origin while the affected plant haul road(s) are in use.

E. After operations begin and until the paving is completed, the permittee shall apply special condition number (2)(A) 2. above to these areas.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

4. Truck Washing Stations - To control the tracking of particulate matter onto plant access roads, the permittee shall install and operate truck washing station(s) to wash trucks leaving the facility. The permittee may suspend use of the truck washing station(s) during periods of freezing conditions when its use would be inadvisable for traffic safety reasons.

5. Moisture Content Testing Requirement for Inherent Moisture Content
   A. The permittee shall conduct moisture content tests on the material processed by emission point, emission unit combinations 11-1 through 11-4, 14-1, 15-1, 16-1, 17-1, 21-1, 22-1, 23-1 through 23-11, 28-1, 29-1, 30-1, 31-1, 33-1, 34-1, 35-1, 109-1, 110-1 through 110-5, 111-1, 112-1, 112-2, 112-3, 113-1 and 114-1 to substantiate the inherent moisture content.
   B. The permittee shall conduct moisture content test(s) in accordance with the test methods and procedures prescribed in the American Society for Testing Materials (ASTM), Designation D-2216 Standard Test Methods for Laboratory Determination of Water (moisture) Content of Soil or Rock, ASTM C-566, Standard Test Method for Total Moisture Content of Aggregate by Drying or other moisture content testing method(s) approved by the Director. The first test must occur within 45 days of the startup of operations. Thereafter, the permittee shall conduct a moisture content test at least once every two (2) years, during the months of June through September. Rock samples can be obtained at the stockpiles or storage bins or from the raw material supplies.
   C. Two (2) copies of the written report of the moisture content tests shall be submitted to the Director within 30 days of completion of the required tests and shall include the wet weight, dry weight, drying time and moisture content of each rock sample, the test date, and the name and title of the individual performing the moisture content analysis. The permittee shall maintain a record of the above testing information and make it immediately available upon request to department personnel.
   D. If the first test should indicate the inherent moisture content of the rock is less than 1.5% by weight, the permittee shall conduct a second test within thirty (30) days. If two (2) consecutive series of test results should indicate the final moisture content of the rock is less than 1.5% by weight, then the permittee will immediately apply amend this permit or submit a modification request to account for the revised information.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

(B) Oxides of Sulfur (SO_x) [BACT]

1. At all times the kiln system is in operation, the permittee shall use inherent dry scrubbing of the kiln system with no alkali bypass, and a lime spray drying system when the raw mills are not operating in order to meet BACT.
2. The permittee shall emit less than 694 pounds of SO_2 per hour of operation based on a 30-day rolling average.
3. The permittee shall emit less than 1.26 pounds of SO_2 per ton of clinker produced based on a 30-day rolling average.
4. The permittee shall operate continuous SO_2 emission monitors to measure, record and report SO_2 emissions compliance.

(C) Oxides of Nitrogen (NO_x) [BACT]

1. In order to meet BACT, the permittee shall use a combination of multi-stage combustion and low-NO_x burners when the kiln system is operating.
2. For the first 24 months after commencing operation, the permittee shall emit less than 1,653.4 pounds of NO_x per hour of operation based on a 30-day rolling average.
3. For the first 24 months after commencing operation, the permittee shall emit less than 3.0 pounds of NO_x per ton of clinker produced based on a 30-day rolling average.
4. After the initial 24 months of operations, the permittee shall emit less than 1,543.2 pounds of NO_x per hour of operation based on a 30-day rolling average.
5. After the initial 24 months of operations, the permittee shall emit less than 2.8 pounds of NO_x per ton of clinker produced based on a 30-day rolling average.
6. The permittee shall operate continuous NO_x emission monitors to measure, record and report NO_x emissions compliance.

(D) Carbon Monoxide (CO) [BACT]

1. The permittee shall use good combustion practices and selective quarrying at all times in order to meet BACT.
2. The permittee shall emit less than 3,307 pounds of CO per hour of operation based on a 30-day rolling average.
3. The permittee shall emit less than 6.0 pounds of CO per ton of clinker produced based on a 30-day rolling average.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

4. The permittee shall operate continuous CO emission monitors to measure, record and report CO emissions compliance from the in-line kiln/raw mill and coal mill exhausts.

(E) Volatile Organic Compounds (VOC) [BACT]

1. To meet BACT, the permittee shall use good combustion practices and selective quarrying at all times.
2. The permittee shall emit less than 182 pounds of VOC per hour of operation based on a 30-day block average.
3. The permittee shall emit less than 0.33 pounds of VOC per ton of clinker produced based on a 30-day block average.
4. The permittee shall demonstrate compliance with special conditions (2)(E) 1, 2 and 3 (VOC BACT) by monitoring, recording and reporting total hydrocarbon (THC) emissions in accordance with the THC requirements of 40 CFR Part 63 Subpart LLL (MACT).

(3) Standards of Performance for Innovative Control Technology (ICT)

(A) Oxides of Nitrogen (NO_x) [ICT]

1. After initiation of the ICT program and in addition to BACT, which is multi-stage combustion and low-NO_x burners, the permittee shall also use an ICT, selective non-catalytic reduction (SNCR), when the kiln system is operating, and no later than 24 months after commencing operations.
2. The permittee shall commence testing and evaluation of the SNCR ICT no later than 24-months after kiln system start-up.
3. After initiation of the SNCR ICT program, the permittee shall emit less than 1,322.8 pounds of NO_x per hour of operation based on a 12-month rolling average, regardless of the success of SNCR.
4. After initiation of the SNCR ICT program, the permittee shall emit less than 2.4 pounds of NO_x per ton of clinker produced based on a 12-month rolling average, regardless of the success of SNCR.
5. The permittee shall submit for department approval a SNCR ICT Testing and Evaluation Protocol prior to commencing the evaluation period. The Testing and Evaluation Protocol shall contain at a minimum:
   A. Quarterly ICT Testing & Evaluation Status and Data Summary Reporting;
   B. Collection and recording of the SNCR and kiln system operating and performance conditions. This information will include:
      (I) kiln/precalciner conditions and the resulting temperatures;
      (II) multi-staged combustion conditions;

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

(III) kiln gas stream retention time in temperature;
(IV) extent of oxidation mode in this window;
(V) location(s) for reagent injection in the pyroprocess;

C. Collection and recording of the atmospheric meteorological conditions affecting SNCR and/or kiln system performance;
D. Recording of any modifications made to the SNCR or kiln systems operating conditions;
E. reagent type;
F. reagent concentration;
G. physical reagent state;
H. NH_3/NO_x molar ratio;
I. type, operating pressure and position of atomizing nozzles;
J. raw feed material properties;
K. raw mill operating conditions;
L. dry lime spray operating conditions;
M. The department and permittee may modify the Testing and Evaluation Protocol of SNCR ICT at any time during the testing and evaluation period in order to acknowledge interim conclusions and focus the remainder of the testing and evaluation period on more productive ends;
N. The findings of the testing and evaluation period will be contained in a final report;

6. The department may grant a term of up to five (5) years for the testing and evaluation of SNCR ICT.
7. The department will issue a final report taking into consideration the findings of the testing and evaluation of SNCR ICT. The department's final report will also include a recommendation of what changes, if any, should be made to the construction permit. The changes may include new emission limitations or SNCR technology-related conditions.
8. The permittee shall demonstrate compliance with this condition using the NO_x monitoring system established in special condition (2)(C)6.

(4) Conditions Resulting from Ambient Air Quality Analyses

(A) Oxides of Sulfur (SO_2)

1. The permittee shall emit less than 595.2 pounds of SO_2 per hour based on a 24-hour rolling average basis from the In-line Kiln and Raw Mills.
2. The permittee shall emit less than 99.2 pounds of SO_2 per hour based on a 24-hour rolling average basis from the Coal Mill.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

3. The permittee shall emit less than 1,267.6 pounds of SO_2 per hour based on a 3-hour rolling average basis from the In-line Kiln and Raw Mills.
4. The permittee shall emit less than 275.6 pounds of SO_2 per hour based on a 3-hour rolling average basis from the Coal Mill.
5. The permittee shall demonstrate compliance with this condition using the SO_2 monitoring system established in special condition (2)(B)4.

(B) Carbon Monoxide (CO)

1. The permittee shall emit less than the values presented in the following table.
2. The permittee shall demonstrate compliance with this condition using the CO monitoring system established in special condition (2)(D)4.

Emission Unit Description	1-hour Rolling Average Limit	8-hour Rolling Average Limit
In-line Kiln and Raw Mills	29,762	2,976.3
Coal Mill	3,310	331.0
Finish Mills 1 & 2	2.5	2.5
Finish Mills 3 & 4	2.5	2.5

Note: all values are in pounds of CO per hour

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

(C) The permittee shall operate the emission units (identified by Source I.D. and Source Description) only during the time periods corresponding to the hours of the day in the following table:

Table from Modeling Analysis			
Source I.D.	**Source Description**	**Limitation**	**Hours of Operation**
		Hours/Day	Hours of Day
EP2/1	Limestone Drilling	16	5 AM to 9 PM
EP2/2	Limestone Drilling	16	5 AM to 9 PM
EP3/1	Limestone Truck Loading	16	5 AM to 9 PM
EP3/2	Limestone Truck Loading	16	5 AM to 9 PM
EP5	Limestone Truck Unloading	16	5 AM to 9 PM
EP18	Truck Unloading	12	6 AM to 6 PM
EP6	Gyratory Crusher	16	5 AM to 9 PM
EP7	Transfer Point	16	5 AM to 9 PM
EP8	Cone Crushers	16	5 AM to 9 PM
EP9	Transfer Point	16	5 AM to 9 PM
EP10	Transfer Point	16	5 AM to 9 PM
PHR1-PHR78	Plant Haul Road	12	6 AM to 6 PM
QHR1-QHR21	Quarry Haul Road	16	5 AM to 9 PM

(D) The permittee shall install, operate and maintain a system of ambient air monitoring stations for PM_{10}. The permittee shall install, operate and maintain this ambient PM_{10} monitoring network according to the following specifications:

1. The initial PM_{10} monitoring network approved under this permit shall consist of at least three (3) continuous monitors.
2. The permittee will conduct meteorological monitoring in conjunction with the PM_{10} monitoring plan. This meteorological monitoring will occur at a minimum of one (1) site as described by an approved Quality Assurance Project Plan (QAPP) for meteorological data and continue for the duration of the PM_{10} monitoring.
3. The permittee shall locate all PM_{10} monitors such that the monitors will measure *ambient* air quality, as approved by the department.
4. The permittee shall report the data collected in accord with this special condition to the department on a quarterly basis.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

5. If concentrations are monitored that exceed a National Ambient Air Quality Standard (NAAQS), the permittee shall report the monitored information (the beginning and ending date and time, and the value for the applicable standard time period) within seven (7) days of the event.
6. Concentrations resulting from this monitoring greater than the NAAQS and attributed to operations permitted herein represent cause for reopening this permit under condition (1)(H). The permittee shall:
   A. conduct a comprehensive review of the results and develop a correction plan;
   B. submit the corrective action plan to the permitting authority for approval; and,
   C. implement the corrective action plan immediately upon department approval.
7. The permittee shall submit a QAPP for PM_{10} for department approval no more than three (7) months before commencing operation.
8. The QAPP will contain the specifications of the monitoring program noted above and include:
   A. the conditions under which the monitoring may be discontinued;
   B. date sampling will commence. Sampling will begin no later than the commencing of operation; and,
   C. the nature of the information to be reported (e.g. hourly concentrations).
9. In conjunction with the PM_{10} monitoring program above, the permittee shall keep records of the daily hours of operation, the amount of rock quarried and crushed by the quarry plant operations. This includes road activity associated with the quarry. The permittee shall record this information for the duration of the PM_{10} monitoring program. The permittee shall submit this information quarterly to the department.

(E) CALPUFF Analysis - The permittee shall conduct and submit the results of the CALPUFF Class II PM_{10} modeling analysis to the department within three (3) months after completion of the one (1) year of data collection. The CALPUFF Class II PM_{10} modeling analysis will be subject to the public participation procedures specified in 10 CSR 10-6.060 section (12), Appendix (B). The permittee will follow these steps to complete the CALPUFF Class II PM_{10} modeling analysis:

1. The permittee shall conduct a CALPUFF modeling analysis for a period of meteorological data, no less than one (1) year, using the approved CALPUFF protocol and on-site meteorological data collected according to the current QAPP approved January 27, 2003.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

2. If the concentrations resulting from this analysis are less than those predicted previously in the ISC analysis, then the permittee may request revisions to the PM_{10} monitoring plan required by condition (4)(D).
3. If resulting concentrations from this analysis are greater than those previously predicted in the ISC analysis, then:
   A. if there are no violations of any air quality standards predicted, then either the permittee may request or the department may initiate changes to the PM_{10} monitoring plan required by condition (4)(D) (e.g. the location of monitors).
   B. if there are violations of any air quality standards predicted, then:
      (I) the department has cause for reopening this permit under special condition (1)(H).
      (II) The permittee will conduct a comprehensive review of the CALPUFF Class II PM_{10} modeling analysis results and develop a corrective action plan.
      (III) The permittee will submit the corrective action plan to the department for approval within two (2) months of submittal of the CALPUFF Class II PM_{10} modeling analysis noted in (4)(E) above.
      (IV) The permittee will implement the correction action plan immediately upon the department's approval but no later than commencement of operations.

(F) Restriction of Public Access - Fencing or Physical Barrier to Restrict Public Access to Property

1. The permittee shall preclude all public access to property, according to U.S. EPA's definitions of ambient air (40 CFR 50.1(e)) and later related EPA determinations, that was excluded from the air quality analyses. This area would include the railroad right-of-way. A map showing the property boundary (precluded areas) is attached as Figure 1. and incorporated by reference.
2. The permittee shall complete construction of the physical barrier to enclose the area prior to commencing operation.

(5) Summer Season NO_x Emission Limit

(A) The permittee shall not emit from the in-line kiln raw mill system more than 1,622 tons of NO_x from the installation during the 153-day annual period, May 1st through September 30th, inclusively. This limit includes 530 tons per year

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

of emission reduction credits (ERC) that will be retired upon issuance of this permit.

(B) The permittee may provide up to an additional 476 tons per year of ERC after issuance of this permit (for a total of up to 1,006 tons per year of ERC retired). For each ton per year of ERC retired, an additional 0.42 tons of NO_x will be added to the per period emission rate quoted above.

(C) In no case shall the permittee emit more than the maximum 1,822 tons of NO_x from the installation during the 153-day annual period, May 1st through September 30th, inclusively from the in-line kiln and raw mill system.

(D) The permittee shall demonstrate compliance with this condition using the NO_x monitoring system established in special condition (2)(C)6.

(E) The permittee shall keep a monthly record during each 153-day annual period of the total amount of NO_x emitted for the period and the amount of the NO_x balance available for the remainder of the period. The monthly record will be available for inspection within days 10 days after the end of the month.

(6) The permittee shall test the kiln system for mercury emissions. The department is requiring this testing to confirm that the mercury emissions are below the BACT significant emission level of 0.1 tons per year (to be extrapolated from the test results).

(A) The permittee shall conduct the testing within 180 days after commencement of operations and if the test results of the initial test are greater than 0.05 tons per year, annually thereafter until the kiln system is fully optimized (e.g. 24-months after commencing operations). Operating permit term testing (once every five (5) years) may be required as a part of the operating permit when the operating permit becomes effective.

(B) The permittee shall submit a performance test protocol for approval at least 30 days prior to each testing.

(C) Failure to demonstrate an emission rate less than the significant emission level shall be cause for reopening this permit.

(7) This special condition is effective only until the issuance of the state operating permit. These emission limitations expire when superceded by the terms and conditions of the operating permit issued by the department.

(A) The permittee shall comply with all applicable provisions of 40 CFR 60, "*Standards of Performance for Coal Preparation Plants*", Subpart A, "General Provisions". Refer to Table 3, "Holcim (US) Inc. - Lee Island, Applicability Table", attached to this permit for a list of sources subject to this standard.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

(B) The permittee shall comply with all applicable provisions of 40 CFR 60, Subpart Kb, "*Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*". Refer to Table 3, "Holcim (US) Inc. - Lee Island, Applicability Table", attached to this permit for a list of sources subject to this standard.

(C) The permittee shall comply with all applicable provisions of 40 CFR 60, Subpart Y, "*Standards of Performance for Coal Preparation Plants*". Refer to Table 3, "Holcim (US) Inc. - Lee Island, Applicability Table", attached to this permit for a list of sources subject to this standard.

(D) The permittee shall comply with all applicable provisions of 40 CFR 60, Subpart OOO, "*Standards of Performance for Nonmetallic Mineral Processing Plants*". Refer to Table 3, "Holcim (US) Inc. - Lee Island, Applicability Table", attached to this permit for a list of sources subject to this standard.

(E) Conditions Resulting from 40 CFR Part 63, Subpart LLL - *National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry* – [PCMACT]. The permittee shall comply with all applicable provisions of 40 CFR 63, Subpart LLL and 40 CFR 63, Subpart A, General Provisions, including but not limited to the emissions limitations and operational limits detailed below. Refer to Table 3, "Holcim (US) Inc. - Lee Island, Applicability Table", attached to this permit for a list of sources subject to this standard.

1. Emission Limitations – In-line Kiln/Raw Mill:
   - A. The permittee shall not emit particulate matter from the in-line kiln/raw mill in excess of 0.15 kg per Mg (0.30 lb. per ton) of feed (dry basis). (§63.1343(c)(1))
   - B. The permittee shall not exceed twenty percent (20%) opacity from the in-line kiln/raw mill. (§63.1343(c)(2))
   - C. The permittee shall not emit dioxin and furans emission from the in-line kiln/raw mill in excess of:
     - (I) 0.20 ng per dscm (8.7×10^{-11} gr per dscf) (TEQ) corrected to seven percent oxygen; or
     - (II) 0.40 ng per dscm (1.7×10^{-10} gr per dscf) (TEQ) corrected to seven percent oxygen, when the average of the performance test run average temperatures at the inlet to the particulate matter control device is 204° C (400° F) or less. (§63.1343(c)(3))

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

D. The permittee shall not emit total hydrocarbon (THC), from the main exhaust of the in-line kiln/raw mill, in excess of 50 ppmvd as propane, corrected to seven percent (7%) oxygen. (§63.1343(c)(4))

2. Emission Limitations – Clinker Cooler:
   A. The permittee shall not emit the particulate matter from the clinker cooler in excess of 0.050 kg per Mg (0.10 lb per ton) of feed (dry basis) to the kiln. (§63.1345(a)(1))
   B. The permittee shall not exceed ten percent (10%) opacity from the clinker cooler. (§63.1345(a)(2))
3. Operational Requirements
   A. The permittee must operate the kiln such that the temperature of the gas at the inlet to the kiln particulate matter control device (PMCD) does not exceed the applicable temperature limit determined in the Initial Performance Test (IPT) or subsequent Performance Tests (§63.1344(a) through (b)). The permittee shall monitor and record the gas temperature at the inlet of the kiln particulate control device on a continuous basis in a manner and with instrumentation consistent with the requirements of (§63.1350(f)(1) through (f)(6)).
   B. The permittee shall prepare and implement a written operations and maintenance plan for affected PCMACT sources. (§63.6 (e)(3) and §63.1350(a) and (b))
4. The permittee shall prepare and implement a written startup, shutdown and malfunction plan for affected PCMACT sources (§63.6(3)).

End of Special Conditions

PROJECT REVIEW OF APPLICATION FOR PERMIT TO CONSTRUCT
ACCORDING TO 10 CSR 10-6.060 SECTION (8)
Project Number: 2000-05-077
Installation ID Number: 186-0044
Permit Number: 062004-005

Holcim (US) Inc. – Lee Island Project
2942 US Highway 61
Bloomsdale, MO 63627

Administratively Complete: May 24, 2000
Addendum 1 Submitted: August 1, 2000
Addendum 2 Submitted: August 4, 2000
Addendum 3 Submitted: May 31, 2002

Parent Company:
Holcim (US) Inc.
210 Jones Road
Waltham, MA 02451

Ste. Genevieve County, Township 39N, Range 7E, Sections 9 & 10

Review Summary

- Holcim (US) Inc. – Lee Island (hereafter in this report referred to as "Holcim") has applied for authority to construct a Portland cement manufacturing installation.

- Rules 10 CSR 10-6.350, *Emission Limitation and Emissions Trading of Oxides of Nitrogen*, and 10 CSR 10-6.270, *Acid Rain Source Permits Required*, do not apply to this facility.

- The department expects hazardous air pollutant (HAP) emissions to be emitted from the proposed equipment. HAPs of concern from this process are: dioxins/furans, chlorine, hydrogen chloride, and compounds of lead, beryllium, mercury, arsenic, cadmium, chromium, manganese and selenium.[1]

- The control technologies associated with best available control technology for this project were determined to be: inherent dry scrubbing, no alkali bypass, raw feed sulfur reduction, and a lime spray drying system when the raw mills are not in operation for SO_2; multi-staged combustion for NO_x; selective quarrying and good combustion practices for CO and VOC; baghouses for point source PM_{10} emissions; and enclosures, road paving, water and/or surfactant spraying for fugitive source PM_{10} emissions.

- Holcim has proposed, and the department has accepted, that selective non-catalytic reduction (SNCR) will be used to ensure adequate control of NO_x emissions will be

[1] Addendum 3, page 3, Table 3.1.

installed to meet the various NO_x emission rate limitations. The permit contains three (3) NO_x emissions rates that eventually (within the first seven (7) years of operation) all apply simultaneously: a 30-day rolling daily average; a monthly 12-month rolling average; and, a 153-day summer season total.

- List of New Source Performance Standards (NSPS) that applies to some of the proposed equipment:[2]
    - 40 CFR Part 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*;
    - 40 CFR Part 60, Subpart Y, *Standards of Performance for Coal Preparation Plants*;
    - 40 CFR Part 60, Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants*.

- Portland cement plants are not among the source types regulated by 40 CFR Part 61, the National Emission Standards for Hazardous Air Pollutants (NESHAPs).[3]

- The Maximum Achievable Control Technology (MACT) standard, 40 CFR Part 63, Subpart LLL, *National Emission Standards for the Portland Cement Manufacturing Industry* applies to the proposed equipment.[4]

- This type of installation (Portland Cement Plant) is on the "List of Named Installations" found at 10 CSR 10-6.020 subsection (3)(B), Table 2.

- The potential emissions are above the major source threshold levels for named installations of 100 tons per year for PM_{10}, SO_2, NO_x, VOC and CO. Therefore, this review was conducted in accordance with the requirements found in Section (8) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

- Ambient air quality modeling was performed to determine the ambient impact of PM_{10}, SO_2, NO_x and CO. Since potential emissions of lead for the application (0.2 tons per year) is below de minimis levels (0.6 tons per year)[5], ambient air quality modeling was not performed.

- Jefferson County is part of the St. Louis area designated nonattainment for the 8-hour ozone (O_3) standard. Jefferson County is also a part of the St. Louis maintenance area for the 1-hour ozone (O_3) standard.

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[2] Page 2-6, section 2.1.3., original application
[3] Page 2-8, section 2.1.4., *ibid*.
[4] Page 2-8, section 2.1.4., *ibid*.
[5] Page 4-1, section 4.1., *ibid*.

- While all emission units associated with this application are located in Ste. Genevieve County, Holcim's property is located in the Counties of Ste. Genevieve and Jefferson. Ste. Genevieve County is an attainment area for all criteria air pollutants.

- U.S. EPA has not provided guidance on attributing ambient ozone concentrations to any installation's ozone precursors, VOC or NO_x emissions. However, because of the proximity of the Holcim's installation to the St. Louis 1-hour maintenance area and the magnitude of the NO_x emissions, the staff did use the best available tools (Urban Airshed Model or UAM-V with the existing ozone attainment demonstration) to estimate the worst case effects of the proposed facility.

- In order to protect the air quality of potentially affected downwind locations, especially the St. Louis area, a special condition on summer season NO_x emissions, limiting Holcim to an insignificant effect on St. Louis, has been included (see special condition (5) at page 18 of 85).

- Holcim will file a Part 70 State Installation Operating Permit application for this installation within 12 months of commencing operation.

- Approval of this construction permit with special conditions and NESHAPS preconstruction authorization is recommended.

Legal Authority

Permit Rule Applicability
This installation is on the "List of Named Installations" found at 10 CSR 10-6.020(3)(B), Table 2. The potential emissions are above the major source threshold levels of 100 tons per year for PM_{10}, SO_2, NO_x, VOC and CO. Therefore, this review was conducted in accordance with the requirements found in Section (8) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, and the state statute found at Missouri Revised Statutes, Chapter 643, Air Conservation, Section 643.075, *Construction without permit prohibited--denial, appeal, procedure --fee, exemption--natural resources protection fund, air pollution permit fee subaccount--city or county permit granted, effect*.

NESHAPs Preconstruction Applicability
This installation will be subject to the standards from 40 CFR 63 Subpart LLL, *National Emission Standards for the Portland Cement Manufacturing Industry*. Any source subject a standard contained in 40 CFR 63, *National Emission Standards for Hazardous Air Pollutants for Source Categories*, is also subject to the General Provisions section of that Part. The General Provisions of Part 63 contains a requirement for preconstruction review and notification.

"*Section 63.5 Preconstruction review and notification requirements. (a) Applicability. (1) This section implements the preconstruction review requirements of section 112(i)(1). After the effective date of a relevant standard, promulgated pursuant to section 112(d), (f), or (h) of the Act, under this part, the preconstruction review*

requirements in this section apply to the owner or operator of new affected sources and reconstructed affected sources that are major-emitting as specified in this section. New and reconstructed affected sources that commence construction or reconstruction before the effective date of a relevant standard are not subject to the preconstruction review requirements specified in paragraphs (b)(3), (d), and (e) of this section."

Technical Specifications

Installation and Project Description

Holcim is a large cement manufacturer in the United States, with eleven (11) Portland cement plants currently operating across the country. Holcim is a wholly owned subsidiary of Holcim Ltd. of Switzerland. Holcim is proposing to construct a new Portland cement manufacturing facility east of the township of Danby in Ste. Genevieve County, Missouri[6]. Holcim has designated the proposed facility as the Lee Island plant.

The Lee Island plant will employ approximately 220 personnel, and have an annual clinker production capacity of 4,828,074 tons. Based on present specifications in the United States, the Lee Island plant will have an annual Portland cement production capacity of 5,082,183 tons. Operational units that will accommodate this level of production include an on-site quarry, raw material storage, crushing and milling, solid fuel (coal and petroleum coke) storage and milling, liquid fuel storage, one preheater/precalciner cement kiln system, product milling, product storage, and loading and unloading systems.

Holcim plans to begin construction of the Lee Island plant in the spring of 2004. Holcim anticipates that the project construction will take approximately thirty-six (36) months to complete.

Cement manufacturing involves chemical and physical processing of large quantities of raw materials. The raw materials used include sources of calcium, silica, alumina and iron. These are the components necessary for the manufacture of the cement chemicals dicalcium silicate, tricalcium silicate, tricalcium aluminate, and tetra-calcium alumino-ferrite. The raw feed is prepared for use in the kiln system by sizing, grinding and blending the various raw materials to produce the necessary mix for quality production. The prepared raw feed is introduced to the kiln system where it is physically and chemically transformed into cement clinker, the intermediate product of Portland cement. In the kiln system, the raw materials are exposed to temperatures reaching up to 3,500^{O}F through a countercurrent process in the kiln and a co-current process in the preheater. The raw materials are heated to 2,650^{O}F, the temperature required to produce quality clinker.

Raw materials utilized for cement kiln feed at the Lee Island plant will be supplied from both on-site and off-site sources. Quarry resources include limestone and shale

[6] Please refer to Figure 1, map of Holcim and surrounding vicinity attached to this report.

deposits that will comprise part of the raw material blend to become clinker, the principal product. Holcim will receive other raw materials from off-site suppliers at the Lee Island plant by rail, truck, and barge via the Mississippi River. Materials received from off-site may include limestone, iron ore, clay, bottom ash, fly ash, bauxite, diaspore, gypsum and other materials as necessary. An important source of raw materials is non-hazardous waste materials from other industries that have the proper chemical and physical properties to be used as a raw material source. The Lee Island plant is designed for, and plans to utilize, these types of materials as sources of calcium, silica, alumina and iron. Preparation of raw materials, depending on its source and physical properties, involves primary and secondary crushing, and screening, blending and grinding in the raw mills prior to entrance into the preheater tower of the cement kiln system.

Holcim is planning to use coal and petroleum coke as the primary fuels for the cement manufacturing process at the Lee Island plant. Holcim will use a single coal mill to prepare raw coal/coke for firing in the precalciner and the kiln. Solid fuels will be received at the facility by truck, rail, and river barge. Holcim will not utilize hazardous wastes at the facility.

Liquid oils and similar non-hazardous materials will be used as a secondary fuel in critical situations such as start-up and back-up. The facility's equipment design will also allow Holcim to beneficially use many other sources of energy bearing, non-hazardous waste materials to fuel the process. As an example, Holcim will use whole or shredded tires as a fuel supplement, when available. As other sources of fuel become available, Holcim will review their chemical and physical properties to assess their potential for providing the necessary thermal energy to the pyroprocess.

The preheater/precalciner pyroprocess is a state-of-the-art design that features five-stage cyclone-type preheater tower, low-NO_x precalciners, and a rotary kiln. The preheater/precalciner portion of the system will be located in a tall tower adjacent to the kiln. The low-NO_x precalciners will be located at the base of the tower. The precalciners allow the burning fuel to be thoroughly mixed with the kiln feed. Excess heated air from the clinker cooler (tertiary air) will provide combustion air for the precalciners. Preheater/precalciner kilns feature greater thermal efficiency as compared to long dry or long wet kilns. This results in significantly lower emissions and decreased fuel consumption per ton of clinker produced. To increase energy efficiency even further, hot exhaust gases from the preheater tower will be utilized to dry kiln feed in the raw mills and fuel in the coal mill.

Holcim will prepare cooled clinker product for distribution in the finish mill system, which employs four (4) vertical roller mills, dust collectors, material bins and feeders, and material handling equipment. The clinker will be mixed with gypsum and other additives, then ground to prepare Portland cement. The finished product will be loaded into trucks, railcars and barges for shipment to customers.

Virtually all areas of operation at the Lee Island plant will incorporate emission controls

that serve to prevent air pollutant emissions.

This is a new installation and therefore there are no previous construction or operating permits issued by the Air Pollution Control Program.

Emission Summary of Proposed Operation
The facility's proposed potential emissions, as presented in the application and resulting from the issuance of this permit, are listed in the following table.

Table 1: Emissions Summary (tons per year)

Pollutant	Regulatory *De Minimis* Levels	Existing Potential Emissions[7]	Existing Actual Emissions[8]	Potential Emissions of the Application[9]	New Installation Conditioned Potential[10]
PM_{10}	15.0	None	None	1,074[11]	1,074
SO_x	40.0	None	None	3,041	3,041
NO_x	40.0	None	None	7,254	6,035[12]
After the first two years				6,771	5,755
With ICT				5,806	5,194
VOC	40.0	None	None	803[13]	803
CO	100.0	None	None	14,506[14]	14,506
HAPs:	[15]	None	None		
Arsenic Compounds		None	None	0.03	0.03
Beryllium Compounds	0.0004	None	None	0.00001	0.00001
Cadmium Compounds		None	None	0.001	0.001
Chlorine		None	None	4.64	4.64
Chromium Compounds		None	None	0.3	0.3
Hydrogen Chloride		None	None	118	118
Lead Compounds	0.6	None	None	0.13	0.13
Manganese Compounds		None	None	2.1	2.1

[7] There are no "Existing Potential Emissions" since this is a new installation.
[8] There are no "Existing Actual Emissions" since this is a new installation.
[9] The potential emissions of the proposed sources taking into consideration control devices and the proposed conditions of this permit.
[10] Installation-wide conditioned potential emissions. Only applicable if this permit incorporates an installation-wide emission cap, supercedes a previous cap, or is included in the cap. Also may reflect the NAAQS limit.
[11] Addendum 3, Appendix C. This is the total, not just the filterable portion. Filterable rate is 592.
[12] This represents the application of multi-staged combustion in the off ozone period (4,213 tons, 3,933 or 3,372 tons of NO_x) and the May 1st to September 30th period limit of 1,822 tons of NO_x, the maximum limit available to Holcim.
[13] Addendum 3, Appendix C.
[14] *ibid*.
[15] The HAP levels of 10.0 tons per year of any single HAP and 25.0 tons per year of the sum of HAPs is used to determine whether Section (9) of the Construction Permit rule applies. That section would apply in the absence of a MACT federal regulation. In this case, there exists a MACT regulation; therefore, section (9) does not apply.

Pollutant	Regulatory *De Minimis* Levels	Existing Potential Emissions[7]	Existing Actual Emissions[8]	Potential Emissions of the Application[9]	New Installation Conditioned Potential[10]
Mercury Compounds	0.1	None	None	0.08	0.08
Selenium Compounds		None	None	0.5	0.5

Emissions of NO_x, SO_2, CO, VOC and PM_{10} are above the federal significance levels and require a Best Available Control Technology (BACT) analysis. The BACT analysis submitted with the PSD application and the permitting authority's comments are summarized below.

Overview of the BACT Process

State rule 10 CSR 10-6.020 paragraph (2)(B)5. defines best available control technology (BACT) as "an emission limitation (including a visible emission limit) based on the maximum degree of reduction for each pollutant which would be emitted from any proposed installation or major modification which the director on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs, determines is achievable for the installation or major modification through application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of the pollutant. In no event shall application of BACT result in emissions of any pollutant which would exceed the emissions allowed by any applicable emissions control regulation, including New Source Performance Standards established in 10 CSR 10-6.070 and 40 CFR part 60 and National Emissions Standards for Hazardous Pollutants established in 10 CSR 10-6.080 and 40 CFR part 61. If the director determines that technological or economic limitations on the application of a measurement methodology to a particular source operation would make the imposition of an emission limitation infeasible, a design, equipment, work practice, operational standard or combination of these may be prescribed instead of BACT. This standard, to the degree possible, shall set forth the emission reduction achievable by implementation of the design, equipment, work practice or operation and shall provide for compliance by means that achieve equivalent results."

That same rule, 10 CSR 10-6.020 paragraph (2)(E)3. defines "emission limitation" as a regulatory requirement, permit condition or consent agreement which limits the quantity, rate or concentration of emissions on a continuous basis, including any requirement which limits the level of opacity, prescribes equipment, sets fuel specifications or prescribes operation or maintenance procedures for an installation to assure continuous emission reduction.

The federal Clean Air Act requires new major stationary sources of air pollution and major modifications to major stationary sources to apply for and obtain a construction permit. Applicants with potential emissions greater than 250 tons per year (100 tons per year for named sources) in air quality attainment areas are subject to Prevention of Significant Deterioration (PSD) permits. (See Missouri State Rule 10 CSR 10-6.060,

Construction Permits Required, Section (8) *Attainment and Unclassified Area Permits*.) One of the requirements of a PSD permit is to apply BACT. A BACT analysis must be conducted on any pollutant that exceeds federal significance levels. The BACT requirement is detailed in Section 165(a)(4) of the Clean Air Act, at 40 CFR 52.21 and 10 CSR 10-6.060(8)(B).

In accordance with the EPA *New Source Review Workshop Manual* (Draft October 1990) a BACT analysis must be prepared, for each pollutant, on a case by case basis. The BACT analysis is performed using the "top down" method. The following steps summarize the top-down approach:

Key Steps in the "Top-Down" BACT Process

Identify All Control Technologies

-This list is comprehensive (lowest achievable emission rate or LAER is included).

Eliminate the Technically Infeasible Options

-An applicant submitting a demonstration of technical infeasibility must clearly document and show, based on physical, chemical, and engineering principles, that technical difficulties preclude the successful use of the control option on the emissions unit under review.

Rank the Remaining Control Technologies by Control Effectiveness

-This ranking must include:

- -Control effectiveness (percent pollutant removed);
- -Expected emission rate (tons per year);
- -Expected emission reduction (tons per year);
- -Energy impacts (BTU, kWh);
- -Environmental impacts (other media and the emissions of toxic and hazardous air emissions); and
- -Economic impacts (total cost effectiveness, incremental cost effectiveness).

Evaluate the Most Effective Controls and Document the Results

-Case-by-case consideration of energy, environmental, and economic impacts;

-If the top option is not selected as BACT, evaluate next most effective control option.

Select BACT

-The most effective option not eliminated is BACT.

BACT Review

This section of the review discusses the process of decision-making that occurred, but does not set forth the actual emission limitations resulting from that decision-making.

Please refer to the appropriate special conditions found at the beginning of this document for the actual emission limitations resulting from this process. The attached Table 3, "*Holcim (US) Inc. – Lee Island, Applicability Table"*, specifically identifies every emission unit subject to a BACT standard.

Germane to any BACT discussion is the energy effects that the application of a particular control technology has on an applicant's emissions. The energy effects are generally included in the discussion through its associated cost increases. Those cost increases are based on today's dollars and do not necessarily communicate the future interest in energy as a commodity. However, in this case it is worth elaborating on the energy component of Holcim's proposal separately. The elaboration is included here simply because Holcim's proposal is an integrated cement manufacturing process as are the energy requirements, which therefore do not lend themselves to discussion under any individual pollutant.

The following table is sufficient to communicate the progression and significance of the process improvements that have occurred in the cement manufacturing industry. The modern cement kiln plant design is determined by the investment cost, the operating cost for energy, labor and maintenance, as well as its environmental compatibility. This facility will be approximately 28% more efficient than the "industry average". As the following table indicates, the "industry average" fuel consumption figure is 3.4 million British Thermal Units (BTU) per ton of clinker. Holcim's system will operate at approximately 2.65 million BTU per ton of clinker.

Cement Pyroprocessing	
Pyroprocess System	**Fuel Consumption kilocalorie per kilogram of clinker**
Long Wet	1,400
Long Dry	1,100
Preheater, 4 Stage	850
Precalciner, 4 Stage	780
Multi-stage Combustion, Precalciner, 5 stage (proposed Holcim (US) Inc. Lee Island)	730

Particulate matter with aerodynamic diameter less than 10 microns (PM_{10})
Holcim's BACT analysis proposed separate BACT for PM_{10} for fugitive emission sources and point sources, as follows:

Fugitive Emissions Sources
Paved and unpaved roads and storage piles[16]

Identify All Control Technologies

- Water Spray and Paving
- Surfactant Spray
- Water Spray
- Paving
- Enclosures

Eliminate the Technically Infeasible Options

Due to operational demands, the permitting authority considers the paving of quarry roads or storage piles infeasible, as that term is used in BACT. The trucks used in the quarry operations will be large (i.e. 175 tons in weight) and would require specially designed and constructed pavement, which is impractical. Additionally, roads associated with the quarry operation change over time as the mining location progresses and/or changes. Surfactant is likewise impractical (i.e. infeasible) for storage piles because storage pile activity would require continual application. Continual application of chemical surfactant may also compromise raw material quality. Neither are enclosures considered practical (i.e. feasible) for roads.

Rank the Remaining Control Technologies by Control Effectiveness and Evaluate the Most Effective Controls and Document the Results

Water spray of storage piles is eliminated due to energy, environmental or economic reasons.

Select BACT

The following controls are BACT for fugitive emission sources of PM_{10}:

- Surfactant spray used in accordance with the manufacturer's specifications and/or periodic water spray to achieve a control efficiency of 90% on quarry haul roads.
- The road used to transport product out and to bring in raw material from off site will be paved. Dust will be removed from the paving periodically through water spray. A truck washing station will be constructed after the product loadout station to minimize off site dirt tracking onto roads.
- Most storage piles will be completely enclosed. Material being transferred into the enclosures will be by conveyor or truck. Enclosure doors will be closed while trucks are being unloaded. Some small, temporary storage piles may be created during normal operation, but they will handle a very small portion of the total material being handled.

[16] Section 3.1.1, page 2-1, Attachment 2, *Response To Preliminary Best Available Control Technology Determination*, November 20, 2002 (revised January 9, 2003).

Point Sources[17]
Quarry operations: conveyers, crushers, screens;
Raw Material Handling: unloading, conveying and crushing;
Coal Preparation: grinding, transport; Process emissions from the in-line kiln and raw mill, clinker and additives transfer, finish milling and product loadout.

Identify All Control Technologies

- Fabric Filter Systems
- Electrostatic Precipitator Systems
- Wet Scrubbing Systems
- Inertial Collection Systems
- High Moisture Content/Wet Suppression
- Enclosures

Eliminate the Technically Infeasible Options

Fabric filters are infeasible for the coal handling sources (emission points 109 through 114) due to safety considerations (explosion hazard). Loading and unloading at emission points 11, 21, 22 and 23 are impractical for the capture of emissions and therefore infeasible to control. The capture of emissions at emissions points 41, 53, 71, 73, 76 and 78 is impractical due to these sources being malfunction contingencies and therefore infeasible to control. Certain other small emission points (2, 3, 5, 13, 14 through 18, 28 through 31, 33, 34 and 35) are also excluded from baghouses control, but because the materials handled will have high moisture contents[18]. The emissions from these points not included for add-on control represent about 3 tons of PM_{10} emissions per year (or about 0.3 % of Holcim's total PM_{10} emissions).

Rank the Remaining Control Technologies by Control Effectiveness and Evaluate the Most Effective Controls and Document the Results

- Fabric Filter Systems (baghouses) are the most effective method of controlling point source PM_{10} emissions from the in-line kiln and raw mill, the clinker cooler, the coal mill system and the finish mill system.
- High moisture content and/or use of enclosures are the most effective control for much of the quarry operations and raw material handling.

Select BACT

The department and Holcim discussed the issue of filterable versus condensable particulate matter. This discussion is pertinent when determining a method of demonstrating compliance. We agreed that condensable particulate matter emissions are only relevant when combustion sources are involved. For this reason, the special conditions will contain separate emission limitations for those emission units with associated combustion processes. The special conditions will also identify emissions from the non-combustion emission units as particulate matter,

[17] Section 3.1.2, page 2-6, *ibid*.
[18] Section 3.1.2.1.1, page 2-7, *ibid*.

for testing purposes, rather than particulate matter nominally less than 10 microns in diameter (PM_{10}).
The following is determined to be BACT for point sources of PM_{10}:

- Fabric Filter Systems for in-line kiln/raw mill, the clinker cooler, the coal mill system , the finish mill system and some quarry operations[19]
- High moisture content and/or use of enclosures for some quarry operations and raw material handling

Oxides of Sulfur (SO_2)[20]

Identify All Control Technologies

- Inherent Dry Scrubbing (IDS)[21]
- Raw Feed Sulfur Reduction[22]
- Use of Alternative Fuels[23]
- Lime Spray Drying[24]
- Wet Lime Scrubbing (WLS)[25]
- Dry Lime Scrubbing (DLS)[26]

Eliminate the Technically Infeasible Options

The permitting authority considers use of natural gas, or LPG technically infeasible[27] as an alternate primary fuel. This is primarily because with no alkali bypass, the inherent scrubbing characteristics of the process effectively eliminate the fuel's contribution to the total SO_2 emissions.

Lime spray drying, when the in-line raw mills are in operation, is also considered infeasible[28] because lime spray drying would duplicate the IDS not provide further control.

There are six (6) WLS systems being installed or proposed on cement plants in Texas, Colorado, Michigan, New York and Pennsylvania. Two (2) WLS have been installed on preheater/precalciner cement plants in Texas, similar to this proposed plant.

The following list of remaining control technologies will be further analyzed:

- WLS

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[19] The special conditions will reference specific emission points. See Table 1., *Fabric Filter Listing* and Table 2., *Enclosures*.
[20] Section 3.2, page 2-14, Attachment 2, *Response To Preliminary Best Available Control Technology Determination*, November 20, 2002 (revised January 9, 2003).
[21] Section 3.2.1.1, page 2-14, *ibid*.
[22] Section 3.2.1.2, page 2-18, *ibid*.
[23] Section 3.2.1.3, page 2-19, *ibid*.
[24] Section 3.2.1.4, page 2-20, *ibid*.
[25] Section 3.2.1.5, page 2-21, and Section 3.2.2.1, page 2-24, *ibid*.
[26] Section 3.2.1.6, page 2-23, *ibid*.
[27] Section 3.2.1.3, page 2-20, *ibid*.
[28] Section 3.2.1.4, page 2-20, *ibid*.

- Lime Spray Drying when the in-line raw mills are not in operation
- DLS when the in-line raw mills are not in operation
- IDS (this occurs when the in-line raw mills are in operation, and to a lesser degree, within the preheater tower)
- Raw Feed Sulfur Reduction

Rank the Remaining Control Technologies by Control Effectiveness

Control Technology	Percent Overall Control Efficiency (% beyond IDS)
Wet Lime Scrubbing (WLS)	99% (7%) @ $13,225 per ton removed beyond IDS
Lime Spray Drying, when the raw mills are not operating	93% (1%) chosen
Dry Lime Scrubbing (DLS), when the raw mills are not operating	93% (1%) eliminated as redundant
Inherent Dry Scrubbing (IDS) without alkali bypass	92% (baseline and inherent)
Raw Feed Sulfur Reduction	43% chosen @ $200,000 per year

Evaluate the Most Effective Controls and Document the Results

WLS is estimated to obtain an overall control efficiency of 99% (an additional 7% reduction beyond that achieved by IDS). Holcim estimated the baseline control efficiency for inherent dry scrubbing to be 92%. WLS will create sludge and wastewater that will have to be treated. Additional fuel will be required to reheat the exhaust gas downstream of the scrubber at an additional cost of 2,085 kW of electrical energy. Holcim estimates control to cost $13,225 per ton of SO_2 removed. Perhaps the most significant cost factor for this project is the availability of natural gas. Holcim would have to construct a natural gas pipeline 78 miles in length. In a case-by-case BACT analysis, other state specific factors, such as proximity to a highly populated area or the possible effects of SO_2 emissions on surrounding crops, can increase the level of what is normally considered economically feasible. However, the permitting authority considers this cost prohibitive for this project. We have eliminated WLS from consideration as BACT for energy, environmental or economic impacts and other costs.

Neither lime spray drying nor DLS would further control SO_2 beyond what IDS achieves

when the raw mills are in operation. DLS is technically feasible but inferior to lime spray drying. We have eliminated DLS from further consideration because of its inferiority (based on temperature dependence) and the conflict with lime spray drying, which can be done when the raw mills are not operating.

Selective quarrying of on-site raw materials and utilization of low sulfur materials from off-site can significantly reduce potential SO_2 emissions. Holcim can selectively mine and waste the high pyrite layers of the quarry rock to reduce potential SO_2 emissions. Holcim estimates that without selective quarrying and use, the emission rate of the kiln system would be 2.21 pounds of SO_2 per ton of clinker, or 5,339 tons of SO_2 per year. Holcim predicts that this will cost about $200,000 per year.

Holcim predicts an overall control efficiency of 93% when using lime spray drying and the in-line raw mills are not in operation. Holcim estimates that the in-line raw mills will be off-line approximately 10% of the time. Holcim proposes to utilize lime spray drying when the in-line raw mills are not in operation, thus making up loss of IDS during those times.

Select BACT

BACT for SO_2 is process specific, inherent dry scrubbing with no alkali bypass and lime spray drying when the in-line raw mills are not in operation. This includes the selective quarrying of on-site materials and utilization of low sulfur materials from off-site.

Oxides of Nitrogen (NO_x)[29]

Identify All Control Technologies

- Good Combustion Practices
- Low-NO_x Burners
- Flue Gas Recirculation
- Multi-Stage Combustion (MSC)
- Selective Non-Catalytic Reduction (SNCR)
- Selective Catalytic Reduction (SCR)[30]
- Reburning
- Riser Fuel Burning
- Biolsolids Injection
- Alternative Fuels

Eliminate the Technically Infeasible Options

The permitting authority has determined that the following methods are technically infeasible:

- Flue Gas Recirculation[31]

[29] Section 3.3, page 2-34, *ibid*.
[30] *Best Available Control Technology Analysis Update, Selective Catalytic Reduction*, December 18, 2003, Holcim (US) Inc., Two Volumes.

- Selective Catalytic Reduction (SCR)[32] [33]
- Reburning[34]
- Riser Fuel Burning[35]
- Biolsolids Injection[36]
- Alternative Fuels[37]

SCR has not been demonstrated on cement plants in the U.S. A pilot testing installation has been made at one plant in Solnhofer, Germany. Holcim has supplied SCR BACT information[30] relating to this facility. The key points of their findings follow.

> The Solnhofer SCR supplier, Lurgi PSI, recently responded to a request for bid by stating that Lurgi is not in a position to state when SCR might be commercially available for cement plant applications and, therefore, "cannot commit to bidding the SCR system at this time."
>
> The Solnhofer SCR catalyst supplier, KWH, in declining to provide a firm bid, stated that introducing this technology for high efficiency NO_x reduction as the first demonstration facility at a U.S. cement plant is "not risk free due to the technical uncertainties involved in the process conditions for U.S. application." They further stated that the catalyst was designed based on an earlier pilot study at Solnhofer and "…the Solnhofer plant cannot be used as a benchmark to extrapolate the SCR catalyst design…"
>
> The claim of ninety percent (90%) NO_x removal efficiency was found to be unsupported or inaccurate, as the annual NO_x emissions from the Solnhofer cement plant were seen to have only reduced forty percent (40%) from their pre-SCR baseline amounts.
>
> The claim of success is also not supported. Neither the Solnhofer facility, its SCR demonstration project vendors, nor the German government authorities have published any information as to long-term operational results, maintenance requirements, operating time statistics, etc. The Solnhofer vendors themselves were unwilling to provide a firm bid to St. Lawrence Cement (another U.S. cement plant currently undergoing air construction permitting in the state of New York) when provided an opportunity to do so.

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[31] Section 3.3.1.3, page 2-36, Attachment 2, *Response To Preliminary Best Available Control Technology Determination*, November 20, 2002 (revised January 9, 2003).
[32] Section 3.3.1.6, page 2-42, *ibid*.
[33] The permittee's Addendum No. 1, page 21, section 7.0, Additional SCR Discussion.
[34] Section 3.3.1.7, page 2-42, Attachment 2, *Response To Preliminary Best Available Control Technology Determination*, November 20, 2002 (revised January 9, 2003).
[35] Section 3.3.1.8, page 2-43, *ibid*.
[36] Section 3.3.1.9, page 2-43, *ibid*.
[37] Section 3.3.1.10, page 2-45, *ibid*. The permittee has made a commitment to maximizing the use of alternative fuels to assist in the reduction of NO_x.

It is difficult to argue the infeasibility of SCR when the technology is being used so successfully in the utility industry. There are, however, significant differences between the two industries that account for the difference in the application of the technology. The utility industry's flue gas being controlled is much less variable over time. That is, the gas stream characteristics do not change greatly with time, either short- or long-term. On the other hand, the cement kiln gas stream has a high degree of fluctuation, both short and long-term. In addition, applying SCR to a pre-existing utility gas stream is much easier because the gas stream characteristics can be measured and designed for. Designing for a nonexistent (preconstruction) cement kiln gas stream (even if short-term variability were not an issue) is made more difficult because the actual gas stream can not be tested and analyzed. Holcim provided information regarding the technical problems relating to the application of this technology on cement kilns, which have not been overcome. Specifically, the propensity for catalyst poisoning, plugging or fouling of the system and the oxidation of SO_2 to SO_3, which would create further downstream fouling and corrosion problems.

Because SCR failed to meet even one of the BACT criteria for availability, the permitting authority considers SCR technically infeasible at this time.

The following are the remaining technologies to be considered:

- Good Combustion Practices
- Low-NO_x Burners
- Multi-Stage Combustion (MSC)
- Selective Non-Catalytic Reduction (SNCR) - Please refer to the section of this report entitled, "Innovative Control Technology".

Rank the Remaining Control Technologies by Control Effectiveness

Control Technology	Control Efficiency	Emission Rate Pounds per ton of clinker
Selective Non-catalytic Reduction, during the period May through September annually	35% @ $3,833	2.6
Multi-stage Combustion	25%, 30% chosen	3.0, 2.8[38]
Low-NO_x Burners	20%-30%	3.2 –2.8

[38] The achievable NOx emission rate for MSC was originally specified as 3.0 lbs/ton of clinker (i.e., 25% reduction). This emission rate was revised to 2.8 lbs/ton of clinker (i.e. 30% reduction) in correspondence to APCP dated November 28, 2000 and March 9, 2001. This emission rate would be achieved two years after commencing operation.

Control Technology	Control Efficiency	Emission Rate Pounds per ton of clinker
Good Combustion Practice	Baseline	4.0

Evaluate the Most Effective Controls and Document the Results

The total cost per ton of NO_x removed for SNCR is $3,833. The cost beyond that achieved by MSC is $12,311 per ton of NO_x removed. If the expected increase of CO emissions is not counted against the technology, the total cost per ton of NO_x removed becomes $1,354.

The use of SNCR at cement plants in the U.S. will create, under certain atmospheric and processing conditions, a detached plume and its associated opacity due to increased ammonia emissions. The federal MACT regulation for Portland cement manufacturing (40 CFR Part 63 Subpart LLL) establishes an opacity limit of 20% for new kilns. The potential for an opacity violation of state and federal regulations would have to be addressed before, or as a part of, determining that SNCR is BACT. SNCR must be eliminated from further consideration as BACT for NO_x based on environmental impacts.

Select BACT[39]

The "top" control technology not eliminated from consideration as BACT for NO_x is MSC. Low-NO_x burners will also be used.

Carbon Monoxide (CO) and Volatile Organic Compounds (VOC)[40]

Identify All Control Technologies

- Good Combustion Practices (GCP)
- Raw Material Substitution and Selective Quarrying
- Thermal Oxidation (RTO)
- Catalytic Oxidation

Eliminate the Technically Infeasible Options

The following are the methods determined to be technically infeasible:

- Catalytic Oxidation[41]

The following are the remaining technologies to be considered:

- GCP
- Raw Material Substitution and Selective Quarrying
- RTO

[39] Section 3.3.3, page 2-54, Attachment 2, *Response To Preliminary Best Available Control Technology Determination*, November 20, 2002 (revised January 9, 2003).
[40] Section 3.4, page 2-56, *ibid*.
[41] Section 3.4.1.4, page 2-61, *ibid*.

Rank the Remaining Control Technologies by Control Effectiveness

Control Technology	VOC Control Efficiency	CO Control Efficiency
Regenerative Thermal Oxidation (including wet lime scrubbing)	50% @ $466,123 per ton removed	90% @ $15,553 per ton removed
Good Combustion Practice and Selective Quarrying	Chosen	Chosen

Evaluate the Most Effective Controls and Document the Results

RTO is eliminated from further consideration for both VOC and CO based on energy, environmental or economic impacts and other costs.

Select BACT

The "top" control technology not eliminated from consideration as BACT for CO and VOC is good combustion practice and selective quarrying.

Innovative Control Technology (ICT)[42]

State rule 10 CSR 10-6.020 paragraph (2)(I)4. defines "Innovative control technology" as "*any system of air pollution control that has not been adequately demonstrated in practice but would have a substantial likelihood of achieving greater continuous emission reduction than any control system in current practice or of achieving at least comparable reductions at lower cost in terms of energy, economics or non-air quality environmental impacts*."

The department is aware of operating cement kilns in Europe and process demonstrations in the U.S. using SNCR. Based on this information, the department believes that selective non-catalytic reduction (SNCR) combined with multi-stage combustion (MSC) has the potential to be significantly more efficient at removing NO_x, compared to MSC alone. This combination of technologies, however, has not been adequately demonstrated in the U.S. In those cases where SNCR has been used outside the U.S. (e.g., Europe), there have not been limitations on opacity comparable to those that would be applied in the U.S. (i.e., a visible orange-brown plume in cold weather) due to the formation of ammonia aerosols.

Installations have the option to propose the use of ICT in place of the top control technology determined as BACT. In this permit application, however, Holcim has proposed SNCR as ICT, in addition to BACT, which is multi-staged combustion. Therefore, some of the regulatory safe guards in place to ensure that ICT is not more

[42] Correspondence from Eric Ervin, Holcim (US) Inc. to Randy Raymond, dated February 18, 2003.

lenient than BACT do not really apply in this case.

SNCR as ICT makes sense from a regulatory perspective in that the combination of SNCR and MSC has not been "adequately demonstrated" yet and has a "substantial likelihood" of reducing NO_x emissions beyond that achieved through MSC alone. Holcim may have to vary its use of SNCR based on the ambient meteorological conditions. Thus, although Holcim will be able to utilize SNCR continuously, SNCR will most likely be more effective when the combination of certain atmospheric and process conditions are more likely to avoid opacity violations (e.g. in the summer time). No one can accurately predict the variations in effectiveness SNCR combined with MSC will have in removing NO_x while maintaining less that 20% opacity. Holcim will develop an ICT implementation protocol, which will address the ICT requirements. Holcim has committed to achieving 2.4 pounds of NOx per short ton of clinker on an annual basis.

State rule 10 CSR 10-6.060 subsection (12)(E), *Appendix E, Innovative Control Technology*, sets out the procedural requirements for approving an Innovative Control Technology.

"The applicant demonstrates to the satisfaction of the permitting authority that the proposed control system will not cause or contribute to an unreasonable risk to public health, welfare or safety in its operation, function or malfunction."

The department has determined that the proposed control system, MSC combined with SNCR, will not cause or contribute to an unreasonable risk to the public health, welfare or safety. Since SNCR will further reduce the pollutant of concern, NO_x, and only minimally increase other criteria pollutants, the department determined that Holcim has satisfied this requirement. The public welfare will additionally be protected by the careful use of the control technologies, especially SNCR, in a manner that avoids visible emissions that exceed opacity limits.

"The owner or operator demonstrates the ability and agrees to achieve a level of continuous emission reduction equivalent to that which would have been required under BACT, by a reasonable date specified by the permitting authority, taking into consideration the technical and economic feasibility. The date shall not be later than four (4) years from the time of startup or seven (7) years from permit issuance."

Holcim will achieve a level of continuous emission reduction through ICT that is equivalent to (and actually greater than) that which would have been (is being) required under BACT. This is true because in this case, ICT is an additional control, not an alternative control.

SNCR will be operated continuously, but will undoubtedly be less effective during certain atmospheric and processing conditions than at other times. Avoiding the violation of other state and federal requirements will be part of the operational procedures Holcim will develop, subject to department approval, during the testing and evaluation phase. This permit will contain specific conditions concerning the beginning

and ending of the testing and evaluation phase of SNCR implementation.

"On the date specified by the permitting authority, the proposed construction, employing the system of innovative control, will meet the requirements for modeling and emission reductions."

"The proposed construction would not, before the date specified by the permitting authority: cause or contribute to a violation of an applicable national ambient air quality standard; Impact any Class I area; or Impact any area where an applicable increment is known to be violated."

Specific conditions of this permit identify the required deadlines. Further modeling, other than that identified in the specific conditions related to monitoring PM_{10}, will not be necessary because the modeling, based on BACT, is sufficient to demonstrate compliance with the standards. In this case, ICT achieves greater reduction than BACT.

"The governor of any adjacent state that will be significantly impacted by the proposed construction gives his/her consent before the date specified by the permitting authority."

Since ICT achieves greater reduction than the technology the department has determined is BACT in this case, the air quality will improve as a result of its implementation. Illinois is the only state significantly impacted by the construction of this facility. However, should Illinois' Governor not consent to the implementation of ICT, higher NO_x emissions will result. Also, the failure of Illinois to consent to the proposed ICT does not mean Holcim cannot implement SNCR technology at its installation as something other than ICT. It would mean that Holcim would not implement SNCR as ICT. The permitting authority did notify the State of Illinois regarding this permit and specifically requested comments regarding their Governor's consent. The permitting authority plans further to request the Illinois Governor's consent by the ICT implementation date.

"All other applicable requirements, including those for public participation, have been met."

No variance or waiver from any requirements is being granted as a result of implementing ICT at Holcim's installation. The department has reviewed and mandated all applicable requirements. The draft permit, which included the ICT proposal, has gone through the required public participation process.

In summary, when evaluating the role of SNCR as ICT, the department considered applicable EPA guidance in addition to state rules cited above. According to EPA's New Source Review Workshop Manual (Draft 1990), the applicant may also "evaluate and propose innovative technologies as BACT" [page B-12, section IV.A. 2.]. If a technology has the potential to achieve "a more stringent emissions level than otherwise would constitute BACT," the applicant may propose the technology. The department determined that since no cement kiln in the United States has operated or adequately

demonstrated the successful use of SNCR, SNCR is an innovative control technology in the United States. Further, while cement kilns in Europe are operating SNCR, the regulatory climate in Europe is much different than in the United States. For that additional reason, the department determined that SNCR is an innovative control technology for this project. Using the ICT regulations to require the use of SNCR, provide guidelines for the operation of the control technology.

In summary, SNCR is consistent with the state regulatory definition of ICT, which is a control that "has not been adequately demonstrated in practice but would have a substantial likelihood of achieving greater continuous emission reduction than any control system in current practice." Therefore, the department chose this regulatory path for the use of SNCR. However, the department does not intend to preclude the selection of this technology as BACT or set a precedent for SNCR as ICT at other facilities. In regards to the future use of SNCR as ICT, the NSR Workshop Manual states that “if a waiver has been granted to a similar source for the same technology, granting of additional waivers to similar sources is highly unlikely since the subsequent applicants are no longer innovative.” Holcim’s ICT program will provide beneficial data on the operation of this control technology that will doubtless be used to assess its use at other cement kilns.

Applicable Requirements

The following is a summary of applicable requirements that apply to Holcim that are not included in special conditions because they have their own legal authority:

Holcim shall comply with each of the following emission limitations. What follows is a summary only. Consult the appropriate sections in the Code of Federal Regulations (CFR) and Code of State Regulations (CSR) for the full text of the applicable requirements. If the following summary is inconsistent with the full text of the applicable requirements as listed in the CFR or CSR, the full text, as listed in the CFR or CSR, has precedence and supercedes the following summaries.

New Source Performance Standards[43]

The following standard summary from 40 CFR Part 60 Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants* applies to the marked sources listed in Table 3, “*Holcim (US) Inc. - Lee Island, Applicability Table*”.

[43] Holcim (US) Inc.’s Original Application dated May 12, 2000, page 2-6, section 2.1.3.

Affected Facility	PM Standard (g/dscm)	Opacity Limit (%)
Any, stack emissions	0.05	7
Any, fugitive emissions	-	10
Crusher, fugitive	-	15
Sources enclosed in a building		
If vented	0.05	7
If not vented	-	Visible emissions not allowed

The department has determined that Holcim will comply with the above requirements.

The following standard summary from 40 CFR Part 60 Subpart Y, *Standards of Performance for Coal Preparation Plants* applies to the marked sources listed in Table 3, "*Holcim (US) Inc. - Lee Island, Applicability Table*".

Affected Facility	PM Standard (g/dscm)	Opacity Limit (%)
Thermal Dryer	0.031	20
Coal Processing and Conveying Equipment (including Breakers & Crushers)	-	20
Coal Storage Systems	-	20
Coal Transfer & Loading Systems	-	20

The department has determined that Holcim will comply with the above requirements.

The department has determined that Holcim will comply with the requirements of 40 CFR Part 60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984 applies to the marked sources listed in Table 3, "Holcim (US) Inc. - Lee Island, Applicability Table".

The standards from 40 CFR 60 Subpart F, *Standards of Performance for Portland Cement Plants* do not apply to Holcim because they are superceded by the 40 CFR 63 Subpart LLL standards.

The following standards summary from 40 CFR 63 Subpart LLL, *National Emission Standards for the Portland Cement Manufacturing Industry* applies to the marked sources listed in Table 3, "*Holcim (US) Inc. - Lee Island, Applicability Table*".

Affected Facility	PM Standard (pound per ton of feed)	Opacity Limit (%)	Dioxin/Furan (ng TEQ per dscm)	THC (ppmvd @ 7% O_2)
In-line kiln and raw mill	0.30	20	0.20 or 0.40	50

Affected Facility	PM Standard (pound per ton of feed)	Opacity Limit (%)	Dioxin/Furan (ng TEQ per dscm)	THC (ppmvd @ 7% O_2)
Clinker cooler	0.10	10	-	-
Finish mill systems	-	10	-	-
Raw material, clinker, or finish product storage bins	-	10	-	-
Conveyor transfer points	-	10	-	-
Bagging systems	-	10	-	-
Bulk loading and unloading systems	-	10	-	-

The department has determined that Holcim will comply with these requirements.

Start-up, Shutdown and Malfunction Conditions, 10 CSR 10-6.050

(1) In the event of a malfunction, which results in excess emissions that exceed one hour, the permittee shall submit to the director within two business days in writing the following information:
   (A) Name and location of the installation;
   (B) Name and telephone number of person responsible for the installation;
   (C) Name of the person who first discovered the malfunction and precise time and date that the malfunction was discovered.
   (D) Identity of the equipment causing the excess emissions;
   (E) Time and duration of the period of excess emissions;
   (F) Cause of the excess emissions;
   (G) Air pollutants involved;
   (H) Best estimate of the magnitude of the excess emissions expressed in the units of the applicable requirement and the operating data and calculations used in estimating the magnitude;
   (I) Measures taken to mitigate the extent and duration of the excess emissions; and
   (J) Measures taken to remedy the situation that caused the excess emissions and the measures taken or planned to prevent the recurrence of these situations.

(2) The permittee shall submit the subparagraph A. information to the director in writing at least ten days prior to any maintenance, start-up or shutdown, which is expected to cause an excessive release of emissions that exceed one hour. If notice of the event cannot be given ten days prior to the planned occurrence, it shall be given as soon as practicable prior to the release. If an unplanned excess release of emissions exceeding one hour occurs during maintenance, start-up or shutdown, the permittee shall notify the director verbally as soon as practical during normal working hours and no later than the close of business of the following working day. A written notice shall follow within ten working days.

(3) Compliance with this rule does not automatically absolve the permittee of any liability for the excess emissions reported.

Submission of Emission Data, Emission Fees and Process Information, 10 CSR 10-6.110

(1) The permittee shall complete and submit an Emission Inventory Questionnaire (EIQ) in accordance with the requirements outlined in this rule.
(2) The permittee shall pay an annual emission fee per ton of regulated air pollutant emitted according to the schedule in the rule. This fee is an emission fee assessed under the authority of section 643.079 RSMo. to satisfy the requirements of the Federal Clean Air Act, Title V.
(3) The fees shall be due April 1st of each year for emissions produced during the previous calendar year. The fees shall be payable to the Department of Natural Resources and shall be accompanied by the Emissions Inventory Questionnaire (EIQ) form, or equivalent approved by the director.

Controlling Emissions During Episodes of High Air Pollution Potential, 10 CSR 10-6.130 - This rule specifies the conditions that establish an air pollution alert (yellow/orange/red/purple), or emergency (maroon) and the associated procedures and emission reduction objectives for dealing with each. If required by the Director, the permittee shall submit an appropriate emergency plan.

Circumvention, 10 CSR 10-6.150 - The permittee shall not cause or permit the installation or use of any device or any other means which, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes an emission of an air contaminant in violation of a rule of the Missouri Air Conservation Commission.

Measurement of Emissions of Air Contaminants, 10 CSR 10-6.180
(1) The director may require any person responsible for the source of an emission of air contaminants to conduct or have conducted tests to determine the quantity or nature, or both, of emission of air contaminants from the source. The director may specify testing methods to be used in accordance with good professional practice. The director may observe the testing. Qualified personnel shall perform all tests.
(2) The director may conduct tests of emissions of air contaminants from any source. Upon request of the director, the person responsible for the source to be tested shall provide necessary ports in stacks or ducts and other safe and proper sampling and testing facilities, exclusive of instruments and sensing devices, as may be necessary for proper determination of the quantity and quality of emission of air contaminants.
(3) The permittee shall give director a copy of the test results in writing and signed by the person responsible for the tests.

Open Burning Restrictions, 10 CSR 10-3.030
(1) The permittee shall not conduct, cause, permit or allow a salvage operation, the disposal of trade wastes or burning of refuse by open burning.
(2) Exception - Open burning of trade waste or vegetation may be permitted only when the permittee can demonstrate that open burning is the only feasible method of disposal, or an emergency exists which requires open burning.
(3) Any person intending to engage in open burning shall file a request to do so with the director. The request shall include the following:
   (A) The name, address and telephone number of the person submitting the application; the type of business or activity involved; a description of the

proposed equipment and operating practices, the type, quantity and composition of trade wastes; and expected composition and amount of air contaminants to be released to the atmosphere, where known;

(B) The schedule of burning operations;

(C) The exact location where the permittee will use open burning to dispose of the trade wastes;

(D) Reasons why no method other than open burning is feasible; and

(E) Evidence that the proposed open burning has been approved by the local fire control authority, which has jurisdiction.

(4) Upon approval of the open burning permit application by the director, the permittee may proceed with the operation under the terms of the open burning permit. Such approval shall not exempt the permittee from the provisions of any other law, ordinance or regulation.

(5) The permittee shall maintain files with letters from the director approving the open burning operation.

Restriction of Emission of Odors, 10 CSR 10-3.090 - No person may cause, permit or allow the emission of odorous matter in concentrations and frequencies or for durations that odor can be perceived when one volume of odorous air is diluted with seven volumes of odor-free air for two separate trials not less than 15 minutes apart within the period of one hour.

Alternate Emission Limits, 10 CSR 10-6.100 – The permittee shall submit proposals for alternate emission limitations on Alternate Emission Limits Permit forms provided by the department. An installation owner or operator must obtain an Alternate Emission Limits Permit in accordance with 10 CSR 10-6.100 before the alternate emission limits become effective.

Compliance Monitoring Usage, 10 CSR 10-6.280

(1) The permittee may use the following in addition to any specified compliance methods for the purpose of submission of compliance certificates:

(A) Monitoring methods outlined in 40 CFR Part 64;

(B) Monitoring method(s) approved for The permittee pursuant to 10 CSR 10-6.065, “Operating Permits”, and incorporated into an operating permit; and

(C) Any other monitoring methods approved by the director.

(2) Any credible evidence may be used for the purpose of establishing whether the permittee has violated or is in violation of any such plan or other applicable requirement. Information from the use of the following methods is presumptively credible evidence whether a violation has occurred:

(A) Monitoring methods outlined in 40 CFR Part 64;

(B) A monitoring method approved for the permittee pursuant to 10 CSR 10-6.065, “Operating Permits”, and incorporated into an operating permit; and

(C) Compliance test methods specified in the rule cited as the authority for the emission limitations.

(3) The following testing, monitoring or information gathering methods are presumptively credible testing, monitoring, or information gathering methods:

(A) Applicable monitoring or testing methods, cited in:
1. 10 CSR 10-6.030, “Sampling Methods for Air Pollution Sources”;
2. 10 CSR 10-6.040, “Reference Methods”;
3. 10 CSR 10-6.070, “New Source Performance Standards”;
4. 10 CSR 10-6.080, “Emission Standards for Hazardous Air Pollutants”; or
5. Other testing, monitoring, or information gathering methods, if approved by the director, that produce information comparable to that produced by any method listed above.

Risk Management Plans Under Section 112(r) - The permittee shall comply with the requirements of 40 CFR Part 68, Accidental Release Prevention Requirements. If the permittee has more than a threshold quantity of a regulated substance in process, as determined by 40 CFR Section 68.115, the permittee shall submit a Risk Management Plan in accordance with 40 CFR Part 68 no later than the date on which a regulated substance is first present above a threshold quantity in a process.

Construction Permits Required, 10 CSR 10-6.060
The permittee must obtain prior approval from the department through the construction permitting process for changes at this installation when: new emission units are constructed, unless those emission units are exempted by rule; or, existing emission units are modified that would:
- increase emissions of any pollutant in violation of an emission limitation expressed in this permit;
- increase emissions of any pollutant that does not have an express emission limitation above its actual emissions;
- or, emit a pollutant not previously emitted.

Administrative Procedures

Preconstruction Permit Issuance Under 10 CSR 10-6.060 Section (8)

The following are a summary of the requirements under 10 CSR 10-6.060 Section (12) Appendices, (A) Appendix A, Permit Review Procedures.

- ⇒ Applicants must submit a complete application for review. The application may contain confidential information. The applicant is responsible for paying a one hundred dollar ($100) filing fee with the application.
- ⇒ Applicants have a duty to supplement or correct an application. Applicants shall submit any relevant facts and promptly submit supplementary information.
- ⇒ Applicants shall submit their information on agency provided standard application forms. Applicants shall provide the company name and address (or plant name and address if different from the company name), the owner’s name and state registered agent, and the telephone number and name of the plant site manager or other contact person. The application must contain a description of the installation’s processes and products. Applicants shall submit all emissions

related information.

⇒ The application form submitted shall contain a certification by a responsible official of truth, accuracy and completeness of the application and supplemental information.

⇒ The permitting authority, as timely as possible, will notify the applicant in writing if the permit processing fee approaches one thousand dollars ($1000) and in one thousand-dollar ($1000) increments after that.

⇒ All applications for sources that emit five (5) or more tons of lead per year, or that contain good engineering practice stack height demonstrations, or that are subject to 10 CSR 10-6.060 section (7) or (8), the permitting authority shall follow the procedures for public participation as specified in 10 CSR 10-6.060 section (12), Appendix (B).

⇒ Final permit determination will be made on the following schedules:

⇒ The permitting authority will make final determinations for complete permit applications processed under 10 CSR 10-6.060 section (7), (8) or (9) no later than one hundred and eighty-four (184) calendar days after receipt of a complete application, taking into account any additional time necessary for missing information;

⇒ Following review of an application, the permitting authority shall issue a draft permit for public comment, in accordance with 10 CSR 10-6.060 subsection (12)(B). A statement setting forth the legal and factual basis for the draft permit conditions (including references to applicable statutory or regulatory provisions) shall accompany the draft. The permitting authority shall send this statement to the administrator, to affected states and to the applicant, and shall place a copy in the public file.

⇒ Because this is not a unified review, no additional procedures are needed.

⇒ After making a final determination whether the permit should be approved, approved with conditions, or denied, the permitting authority shall notify the applicant in writing of the final determination and the total permit processing fees due.

⇒ If payment of permit processing fees has not been received from the applicant eighty (80) calendar days after the final determination, the permitting authority shall issue in writing to the applicant a final notice of payment due.

⇒ If payment of permit processing fees has not been received from the applicant ninety (90) calendar days after the final determination, the permitting authority shall notify the applicant that the permit has been denied, provided the application previously had been approved in the final determination. The permitting authority also shall advise the applicant that the fee is still due and as specified in 10 CSR 10-6.060 paragraph (10)(A)3., the fee shall have interest imposed upon it from the date of billing until payment is made.

⇒ No later than three (3) calendar days after receipt of the whole amount of the fee due, the permitting authority will send the applicant a notice of payment received. The permit will also be issued at this time, provided the final determination was for approval and the permit processing fee was timely received.

NESHAPS Preconstruction Approval Under Sections 40 CFR 63.5 and 63.9

Section 40 CFR 63.5(b) Requirements for existing, newly constructed, and reconstructed sources. (3) After the effective date of any relevant standard promulgated by the director[44] [Administrator] under this part, no person may, without obtaining written approval in advance from the director[47] [Administrator] in accordance with the procedures specified in paragraphs (d) and (e) of this section, do any of the following: (i) Construct a new affected source that is major-emitting and subject to such standard;

The following are a summary of the requirements under 40 CFR 63.5(e) Approval of construction or reconstruction.

- ⇒ If the director determines that, if properly constructed, or reconstructed, and operated, a new source will not cause emissions in violation of the relevant standard(s) and any other federally enforceable requirements, the Administrator will approve the construction or reconstruction.
- ⇒ The director will notify the owner or operator in writing of approval or intention to deny approval of construction or reconstruction within 60 calendar days after receipt of sufficient information to evaluate an application submitted. The 60-day approval or denial period will begin after the owner or operator has been notified in writing that the application is complete. The director will notify the owner or operator in writing of the status of the application, that is, whether the application contains sufficient information to make a determination, within 30 calendar days after receipt of the original application and within 30 calendar days after receipt of any supplementary information that is submitted.
- ⇒ When notifying the owner or operator that the application is not complete, the director will specify the information needed to complete the application and provide notice of opportunity for the applicant to present, in writing, within 30 calendar days after notification of the incomplete application, additional information or arguments to the director to enable further action on the application.

AMBIENT AIR QUALITY IMPACT ANALYSIS[45]

An ambient air quality impact analysis (AAQIA) was performed to determine the impact of PM_{10}, CO, SO_2, NO_x and HAP emissions at or beyond the property boundary of the proposed Holcim (US), Inc. facility. Additional impacts on visibility, growth, soils, plants and animals were also evaluated within the Class II area surrounding the facility. Refer to the August 7, 2003 memorandum from Dawn Froning to Steve Jaques, through Jeffry D. Bennett, P.E., entitled, "Ambient Air Quality Impact Analysis (AAQIA) for Holcim (US), Inc. – Lee Island Project, Prevention of Significant Deterioration (PSD) Modeling –

[44] Under the terms of state delegation, the department director takes on the duties of the US EPA Administrator.

[45] Refer to August 7, 2003 memorandum from Dawn Froning to Steve Jaques, through Jeffry D. Bennett, P.E.., entitled, "Ambient Air Quality Impact Analysis (AAQIA) for Holcim (US), Inc. – Lee Island Project, Prevention of Significant Deterioration (PSD) Modeling – 01/09/03 Submittal – REVISION August 2003".

01/09/03 Submittal – REVISION August 2003".

If, however, the applicant can not demonstrate compliance with the NAAQS (as is the case with PM_{10}), the applicant must demonstrate that the proposed emissions will not have a significant impact at any violating receptor at the time a violation is predicted to occur. Holcim did not have a significant impact at the same time a violation was predicted to occur for the annual or 24-hour averaging times. The following table summarizes the results of this analysis:

The AAQIA must be completed for any air contaminant that exceeds the *de minimis* emission levels outlined in 10 CSR 10-6.020 subsection (3)(A) Table 1. The following table lists the air contaminants, rates of emission and their associated *de minimis* levels:

Air Contaminant	De Minimis Level	Holcim's Emission Rate in Application	AAQIA Necessary
Carbon monoxide (CO)	100.0	14,506	Yes
Nitrogen dioxide (NO_x)	40.0	7,254	Yes
Particulate Matter (PM_{10})	15.0	1,074	Yes
Sulfur dioxide (SO_2)	40.0	3,041	Yes
Ozone (to be measured as VOC)	40.0	803	Yes[46]
Lead	0.6	0.13	No
Mercury	0.1	0.08	No[47]
Beryllium	0.0004	0.00001	No

Note: All number values in table have the units of measure of tons per year.

Based upon emission estimates provided by Holcim, PM_{10}, NO_x, SO_2, CO, and ozone exceed the *de minimis* levels, thereby triggering the requirement to perform a comprehensive air quality analysis. As with all PSD permits, the air quality analysis performed for this application was conducted in multiple phases. Initially, a preliminary modeling analysis was performed and only included emission increases resulting from the proposed operations at Holcim. The preliminary analysis determines if the applicant, on a pollutant by pollutant basis, will be required to perform preconstruction monitoring, additional air quality modeling, or if the applicant can forego further analysis altogether. 10 CSR 6.060 (11) (D) Table 4 outlines the significance levels used in this determination. If the preliminary analysis indicates that the facility will not significantly impact the air quality within a region, no further analysis is necessary. If the significance levels are exceeded, a full impact analysis will be required. Please note this does not relieve the facility of its obligation to perform a Class I analysis or additional impact analyses on growth, visibility, and soils. The following table displays the results of the preliminary modeling analysis:

[46] The regulation requires ozone monitoring in lieu of modeling when the VOC threshold value is exceeded.

[47] Modeling of certain HAP emissions may be required by 10 CSR 10-6.060 subsection (12)(J). This will be discussed further in a following later section of the report.

Air Contaminant	Significance Level	Holcim's Preliminary Analysis Results	Is the Impact Significant?
Carbon monoxide (CO)			
1-hour	2000	1382	No
8-hour	500	409	
Nitrogen dioxide (NO_x)			
(the 1st two years) Annual	1.0	3.4	Yes
(After 1st two years) Annual	1.0	3.2	Yes
Particulate Matter (PM_{10})			
24-hour	5	31.6	Yes
Annual	1.0	4.8	Yes
Sulfur dioxide (SO_2)			
3-hour	25	361.68	Yes
24-hour	5	83.11	Yes
Annual	1.0	2.33	Yes

Note: All number values in this table have the units of measure of micrograms per cubic meter.

CO was the only pollutant that did not require a full impact analysis.

In addition to providing an indication of what pollutants must undergo a full impact analysis, the results of the preliminary analysis determine what, if any, preconstruction monitoring will be required. 10 CSR 6.060 (11) (B) Table 2 outlines the significance levels used in this determination. If the preliminary analysis indicates that the facility will not exceed the monitoring significance level, no preconstruction monitoring is necessary. If the monitoring significance levels are exceeded, one year of preconstruction monitoring is required to be collected prior to the submittal of the permit application.

Pollutant	Monitoring Significance Level	Holcim's Preliminary Analysis Results	Preconstruction Monitoring Required?
Carbon Monoxide (CO) 8-Hour	575 µg/m^3	409 µg/m^3	No
Nitrogen Dioxide (NO_x) Annual	14 µg/m^3	1st two Years 3 µg/m^3 After two Years 3 µg/m^3	No[48]
Sulfur Dioxide (SO_2) 24-Hour	13 µg/m^3	36 µg/m^3	Yes
Particulate Matter (PM_{10}) 24-Hour[49]	10 µg/m^3	31 µg/m^3	Yes
Ozone	Net Emissions Increase of VOCs greater than 100 tons per year	Not Applicable	Yes

Preconstruction monitoring of PM_{10}, NO_x, SO_2 and ozone (note: ozone data is not collected during the winter months) was performed during the period July 7, 1999 through September 30, 2000. The results obtained from the ambient air quality monitoring study are summarized in the December 6, 2000 memorandum entitled "Holnam, Inc Preconstruction Monitor Data Analysis".

The full impact modeling analysis expands upon the preliminary analysis by requiring the applicant to consider emissions from the proposed source in conjunction with other existing sources, and secondary emissions resulting from residential, commercial and industrial growth due to the new project.

Each PSD applicant must demonstrate that the proposed emissions will not cause or contribute to a violation of any NAAQS. If the impact from the proposed source, in conjunction with existing sources, does not result in a predicted violation, then no further NAAQS analysis is necessary. If, however, the applicant can not demonstrate compliance with the NAAQS (as is the case with PM_{10}), the applicant must demonstrate that the proposed emissions will not have a significant impact at any violating receptor. Holcim was able to do just that for the annual PM_{10} NAAQS. If the applicant cannot demonstrate less than significance at any time, they have the option of demonstrating that at the times the NAAQS exceedances are predicted, they have an insignificant effect. Holcim was able to demonstrate an insignificant effect during times and at locations of predicted exceedances of the 24-hour PM_{10} times of NAAQS predicted exceedances. The following table summarizes the results of this analysis:

[48] Holcim (US) Inc. conducted monitoring for NO_x voluntarily.
[49] The highest modeled value is used in this analysis for comparson to the monitoring threshold. This value is different from the increment analysis value.

Air Contaminant	NAAQS	Holcim's Results	Exceedance Predicted
Nitrogen dioxide			
(1st two years) Annual	100	48[50]	No
(After 1st two years) Annual	100	48	No
Particulate Matter - PM_{10}			
24-hour	150	12,636[51]	Yes
Annual	50	1,624[52]	Yes
Insignificance			
24-hour	5	11	Yes
Annual	1.0	0.4	No
Insignificance in space & time			
24-hour	5	3	No
Sulfur dioxide			
3-hour	1,300	4,430[53]	Yes
24-hour	365	864[54]	Yes
Annual	80	25.66[55]	No
Insignificance			
3-hour	25	17.85	No
24-hour	5	5.21	Yes
Insignificance in space & time			
24-hour	5	1.74	No

Note: All number values in this table have the units of measure of micrograms per cubic meter.

In addition to evaluating compliance with the NAAQS, Holcim (US), Inc. had to show compliance with the PSD increment standards for PM_{10}, NO_x, and SO_2. Increment can be defined as the maximum increase over baseline concentrations that are allowed to occur on a pollutant-by-pollutant basis. Each increment standard was developed to insure that the air quality within a given region would not significantly deteriorate. 10 CSR 6.060 (11) (A) Table 1 outlines the increment standards based upon area classification and pollutant. In its evaluation, Holcim evaluated two existing baselines in Ste. Genevieve and Randolph (IL) Counties within the significant impact area of the proposed construction for all increment consuming sources. The following table summarizes the results of this analysis:

[50] Includes a background concentration of 24 ug/m^3
[51] Includes a background concentration of 47.0 ug/m^3
[52] Includes a background concentration of 14.0 ug/m^3
[53] Includes a background concentration of 158.6 ug/m^3
[54] Includes a background concentration of 41.7 ug/m^3
[55] Includes a background concentration of 8.0 ug/m^3

Air Contaminant	Air Quality Increment	Holcim's Results	Increment Exceedance Predicted
Nitrogen dioxide (the first two years)			
Annual (Holcim's area[56])	25	3[58]	No
Annual (Randolph Co. Ill.[57])	25	2	No
Nitrogen dioxide (After the first two years)			
Annual (Holcim's area)	25	3	No
Annual (Randolph Co. Ill.)	25	2	No
Particulate Matter - PM_{10}			
24-hour	30	26	No
Annual	17	5	No
Sulfur dioxide			
3-hour (Holcim's area)	512	322	No
24-hour (Holcim's area)	91	51	No
Annual (Holcim's area)	20	2	No
3-hour (Randolph Co. Ill.[47])	512	96	No
24-hour (Randolph Co. Ill.)	91	22	No
Annual (Randolph Co. Ill.)	20	2	No
3-hour (Chem. Lime Off-site[59])	512	303	No
24-hour (Chem. Lime Off-site)	91	81	No
Annual (Chem. Lime Off-site)	20	4	No
3-hour (Chem. Lime On-site[60])	512	18	No
24-hour (Chem. Lime On-site)	91	7	No
Annual (Chem. Lime On-site)	20	0.4	No

Note: All number values in this table have the units of measure of micrograms per cubic meter.

In addition to evaluating impacts within the Class II area, the AAQIA included a detailed evaluation of Holcim (US), Inc.'s predicted impact on the Mingo National Wilderness Area, one of two sites designated as a mandatory federal Class I area. The Class I analysis requires the applicant to demonstrate that it will not have adverse impact on visibility or the Class I increments and will not lead to excessive sulfur or nitrogen deposition within the Class I area. Refer to the February 10, 2004 memorandum from Dawn Froning to Kyra Moore, through Jeffry D. Bennett, P.E., entitled, "Class I Ambient Air Quality Impact Analysis (AAQIA) for Holcim (US), Inc.-Lee Island Project-December

[56] Holcim baseline area.
[57] Pre-existing increment area in Illinois.
[58] Holcim's emission rate used for this and previous analyses were 19.9 and 18.6 tons of NO_x per day (first two years and afterward, respectively). Holcim is allowed 19.9 or 18.6 (first two years or afterward rates) tons of NO_x per day during the winter months (October through April inclusively) but limited to 10.6 (or up to 11.3) tons of NO_x per day during the summer months (May through September, inclusively).
[59] Pre-existing increment area in Missouri.
[60] Chemical Lime Co.'s emissions are not used when evaluating within its own property boundaries.

2003 and January 2004 Submittals".

The visibility modeling results exceed the 10% level of concern. The federal land manager objected to the 24-hour sulfur dioxide emission increase proposed by Holcim during the comment period. The federal land manager expressed no concern with the draft permit 24-hour sulfur dioxide emission levels. Therefore, the 24-hour SO_2 emission limitations will remain as they were in the draft permit. Holcim may continue to work with the federal land manager and the department to develop an acceptable proposal, which would result in a modification. A draft permit modification would be subject to public participation before final department action. The results obtained from the sulfur and nitrogen deposition analysis show concentrations exceeding the significance level of 0.005 kg/ha/yr. The federal land manager expressed no concern with these levels. Therefore, no further action is necessary.

The following table summarizes the Class I Increment analysis results:

Pollutant	Class I Significance Level	Holcim's Results	Significance Exceedance Predicted
PM_{10}			
24-hour	0.3	0.176	No
Annual	0.2	0.00991	No
NO_x			
Annual	0.1	0.0311	No
SO_2			
3-hour	1	3.06	**Yes**
24-hour	0.2	0.667	**Yes**
Annual	0.1	0.024	No

Note: All number values in this table have the units of measure of micrograms per cubic meter.

Holcim's results for the SO_2 significance determination exceed the significance levels for the 3- and 24-hour averaging times triggering a cumulative SO_2 analysis. The cumulative SO_2 analysis predicts no violations will occur on any days that Holcim has a significant impact.

Holcim's Class I Increment analysis predicts no increment violations.

CALPUFF Class II PM_{10} Modeling Analysis

EPA commented[61] that the variation in terrain in and around Holcim warrants further analysis. Holcim has agreed to, although not required by regulation, conduct these analyses and provide the results. These results are expected to confirm the guideline modeling results rather than conflict with them.

[61] Refer to the U.S. EPA MEMORANDUM from Richard L. Daye, ARTD/APDB, to Jeffery D. Bennett, P.E., Department of Natural Resources, dated March 26, 2001.

However, as would be expected from any further work, if the concentrations resulting from this analysis are less than those predicted previously in the required ISC analysis, then Holcim may request a revision to the PM_{10} monitoring plan required by special condition (4)(D).

If the concentrations resulting from the CALPUFF Class II PM_{10} analysis are greater than those predicted previously in the ISC analysis, then further work will be necessary. If there are no standard violations predicted, then the department may require changes to the PM_{10} QAPP (e.g. the location of monitors) and nothing else.

If the full CALPUFF Class II PM_{10} analysis predicts an air quality standard violation, then the department will reopen the permit under special condition (1)(H). Once reopened, the department will incorporate the approved corrective action plan into the permit. The corrective action plan is the result of the following steps taken by Holcim:

- conduct a comprehensive review of the results;
- develop a corrective plan;
- submit the corrective action plan to the department for approval; and,
- implement the corrective action plan immediately upon incorporation into the permit.

Photochemical Evaluation of Holcim (US) Inc. – Lee Island

At the time of Holcim's application, the St. Louis area was classified as a moderate nonattainment area and Missouri was in the process of acquiring approval from US EPA for the St. Louis 1-hour ozone attainment and maintenance plan. This plan included an attainment demonstration based on the Urban Airshed Model (UAM-V). This demonstration is very complex and takes several years to develop.

The supplemental attainment demonstration submitted to the EPA for St. Louis indicated that the area could attain the ozone standard by 2004 and maintain the standard beyond 2004. However, the attainment demonstration for St. Louis did not account for the construction of Holcim's proposed facility or other proposed changes that result in the NO_x emission growth in areas upwind of St. Louis. As originally proposed (but not permitted), Holcim would emit approximately 18.6 tons per day of NO_x (19.9 tons per day in the first two years of operation). Due to the very large amount of NO_x emissions and the proximity to the St. Louis area, several sets of photochemical modeling sensitivities were performed to predict Holcim's ozone impact using the St. Louis area's attainment demonstration. The results of these analyses indicated that Holcim had the potential to impact the region's ability to maintain the one-hour ozone standard.

As mandated by Missouri Air Law, Chapter 643 RSMo, the department is required to manage the air resources available to Missouri without unduly burdening the citizens with unacceptable economic consequences. Our goal is to allow growth without doing unreasonable harm to the air quality in regions with existing air quality problems. Based on that goal and Holcim's original application, the department concluded that ozone

precursor emissions from Holcim as originally proposed would have a substantial impact on the St. Louis area and conditions to limit these emissions must be included in the permit.

There are several options that the permitting authority could under take to minimize the impacts of Holcim on ozone in St. Louis. In an effort to ensure continued compliance in St. Louis, Holcim and the department have investigated means to counteract the facility's effects. The most straightforward option is to reduce Holcim's emissions to acceptable levels. As part of the solution to the ozone impact issue, Holcim has proposed to implement selective non-catalytic reduction (SNCR) for the control of NO_x as an innovative control technology (ICT). Another method to reduce the effects is to acquire countervailing emission reductions in the area. These emission reductions would be outside of the facility's operations and counteract the emission impacts.

The management of emission reduction credits (ERC) within maintenance or nonattainment areas is managed through the federally approved state rule 10 CSR 10-6.410, *Emissions Banking and Trading*. The use of ERC within a previous nonattainment area, when the source is located in an attainment area, has not been done before. But in this instance where localized attainment area emission increases alone would lead to an unacceptable affect, or counteract our ability to maintain healthy air quality, it is warranted. Furthermore, ERC within the previous nonattainment area have the potential of greater benefit than Holcim's increase, given their proximity to the area itself.

In order to balance the requirements of protection of air quality and economic development of the state, a level of acceptable impact on the St. Louis area and other surrounding communities had to be identified. This level of ozone impact is applied to the maximum peak ozone difference. Ultimately, the uncertainty associated with this type of analysis and the economic impact from this project, an ozone impact of 2 ppb was determined to be acceptable. The emission levels included in the table below reflect an acceptable impact from Holcim on the 1-hour ozone concentrations in the St. Louis area.

NO_x emission rate per ozone limit period corresponding to less than 2.0 parts per billion ozone	1,400 tons per period
Holcim's 530[62] tons per year ERC being retired upon permit issuance	222 tons per period
476 tons per year maximum allowable additional ERC to be retired prior to commencing operations	200 tons per period
Upper bound of acceptable NO_x emission rate accounting for ERC retirement	1,822 tons per period

HAP Modeling discussion[63]

The following table summarizes the determinations of whether further HAP modeling is necessary:

Air Contaminant	Modeling Trigger Level	Holcim's Emission Rate	Modeling Required
Arsenic Compounds	0.005	0.03	Yes
Beryllium Compounds	0.008	0.00001	No
Cadmium Compounds	0.01	0.001	No
Chlorine	0.1	4.64	Yes
Chromium Compounds	5	0.3	No
Hydrogen Chloride	10	118	Yes
Lead Compounds	0.01	0.13	Yes
Manganese Compounds	0.8	2.1	Yes
Mercury Compounds	0.01	0.08	Yes
Selenium Compounds	0.1	0.5	Yes

Note: All number values in this table have the units of measure of tons per year.

[62] These emission reduction credits that will be retired resulted from transactions with Solutia for 319 tons, PrintPack for 51 tons, and Dow Chemical for 160 tons.

[63] Section XIV, page 21, "*Ambient Air Quality Impact Analysis (AAQIA) for Holcim (US), Inc. – Lee Island Project, Prevention of Significant Deterioration (PSD) Modeling – 01/09/03 Submittal – REVISION August 2003*".

The following table summarizes the HAP risk assessment modeling that was performed:

Air Contaminant	Risk Assessment Level	Holcim's Results	Compliance
Arsenic Compounds			
8-hour	0.0267	0.00087	Yes
24-hour	0.0005	0.00038	Yes
Annual	0.0002	0.00002	Yes
Chlorine			
8-hour			
24-hour	3.95	0.05907	Yes
Annual	3.95	0.00327	Yes
Hydrogen Chloride			
8-hour			
24-hour	7	1.50214	Yes
Annual	7	0.08324	Yes
Lead Compounds			
8-hour	2	0.00385	Yes
24-hour			
Annual			
Manganese Compounds			
8-hour	0.89	0.0611	Yes
24-hour			
Annual			
Mercury Compounds			
8-hour			
24-hour	0.003	0.00097	Yes
Annual	0.0014	0.00003	Yes
Selenium			
8-hour			
24-hour	0.54	0.00628	Yes
Annual	0.54	0.00031	Yes

Note: All number values in this table have the units of measure of micrograms per cubic meter.

Mercury Discussion

Holcim has developed an extensive review of the mercury issue in preparation of the permit application, in response to the permitting authority's requests.

There will be mercury emissions from the operation of this cement kiln system. However, the evidence indicates that Holcim met every standard evaluated. Perhaps the most significant factor affecting the mercury emissions is the energy efficiency of this particular cement kiln system design. The energy information is presented at the outset of the BACT discussion. To summarize the mercury information:

- Cement kiln systems have demonstrated mercury removal efficiencies ranging from 30 to 90 percent;

- The potential emissions of mercury were based on a stack concentration of 0.01 mg/m^3, resulting in an estimate of 160 pounds per year;
- The 0.08 tons of mercury per year emissions estimate is below the BACT review threshold level of 0.1 tons of mercury per year;
- The mercury air quality analysis threshold of 0.01 tons per year does require that an analysis be performed;
- The agency's risk assessment levels[64] are 0.14 µg/m^3 and 0.07 µg/m^3, 24-hour and annual respectively;
- Holcim's maximum predicted concentrations were 0.00097 µg/m^3 and 0.00003 µg/m^3, 24-hour and annual respectively;
- A acceptable endogenous soil concentration of 0.039 parts per million (ppm) was obtained from the Geochemical Survey of Missouri, Geological Survey Professional Paper 954-H,1 for comparison;
- Holcim's predicted maximum soil deposition over the 100-year life of the facility is 0.0215 ppm.

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (8) Missouri State Rule 10 CSR 10-6.060 *Construction Permits Required*, I recommend this construction permit be granted with special conditions.

Also on the basis of this review conducted in accordance with 40 CFR Part 63 *National Emission Standards for Hazardous Air Pollutants for Source Categories*, Subsection 5(e), I recommend NESHAPs construction authorization be given.

Randall E. Raymond
Environmental Engineer

June 7, 2004
Date

[64] Provided in an email from Eric Giroir to Dawn Froning, dated June 29, 2001, subject "Holnam, Inc. RALs". A file named Holnam RALs.doc was attached to the email.

THE FOLLOWING DOCUMENTS ARE INCORPORATED BY REFERENCE INTO THIS PERMIT:

- Some emission factors and control efficiencies used in this analysis were obtained from the Environmental Protection Agency (EPA) document AP-42, Compilation of Air Pollutant Emission Factors, Fifth Edition, section 11.6, January 1995, Chapter 13.2.2, *Unpaved Roads*, Appendix C.1, *Procedures For Sampling Surface/Bulk Dust Loading*, Appendix C.2, *Procedures For Laboratory Analysis Of Surface/Bulk Dust Loading Samples*.
- The Application for Authority to Construct dated May 12, 2000 received May 12, 2000, The application is assigned Project No. 2000-05-077.
    - Letter from Eric L. Ervin, Project Manager, to Kyra Moore, New Source Review Unit Chief, dated November 13, 2003, "*Holcim (US) Inc. – Lee Island Project, Revised Application for Authority to Construct*". Application designates Holcim (US) Inc. as the owner and operator and Eric Ervin as the responsible official of the installation.
    - Letter from Daniel D. Carney, P.E., Environmental Engineer, to Kyra L. Moore, New Source Review Unit Chief, dated December 2, 2003 and entitled "*Holcim (US) Inc. – Lee Island – Addendum for Startup/Backup Fuel System Application*"
- The Addendum No. 1 dated August 1, 2000, received August 2, 2000 to Project No. 2000-05-077.
- The Addendum No. 2 dated August 4, 2000, received August 7, 2000 to Project No. 2000-05-077.
- Memorandum from Richard L. Daye, Regional Meteorologist, to Jeffery D. Bennett, P.E., Air Quality Modeling Chief, dated March 26, 2001 entitled "*Holnam – Lee Island Facility*"
- Letter from Dawn Froning, Environmental Specialist III, to Daniel D. Carney, Environmental Engineer, dated July 30, 2001 entitled "*Air Pollutant Impacts on Plants, Soils and Animals from the Proposed Holnam, Inc. – Lee Island Facility*".
- Letter from Dawn Froning, Environmental Specialist III, to Daniel D. Carney, Environmental Engineer, dated July 30, 2001 entitled "*Evaluation of Hazardous Air Pollutant Impacts*".
    - Attachment to July 30, 2001 letter: e-mail from Eric Giroir, dated June 29, 2001 transmitting table entitled "*Appropriate RALS for the Holnam Ambient Air Quality Impact Analysis*"
- The Addendum No. 3 dated May 31, 2002 to Project No. 2000-05-077
    - Letter from Daniel D. Carney, P.E. to Dawn Froning dated January 9, 2003 and entitled "*Holcim (US) Inc. Lee Island Project Response to APCP's Request for Revised Modeling of Roads*"

- "*Response to Preliminary Best Available Control Technology Determination*", submittal November 20, 2002,
    - Revised January 9, 2003
    - Supplemented February 19, 2003
    - Corrected page 2-70 provided via letter from Daniel D. Carney, P.E., Senior Engineer, to Kyra L. Moore, New Source Review Unit Chief, dated January 30, 2004 and entitled "*Holcim (US) Inc. – Lee Island – Emission Limit Averaging Times for CO and VOC*"
- Letter from Terry Rowles, Air Quality Monitoring Unit Chief, to Eric Ervin, Holcim, Inc., dated January 27, 2003 entitled "*On-Site Meteorological Monitoring Quality Assurance Project Plan-Holcim, Inc.*"
- Letter from Randy E. Raymond, Permit Section Chief, to Eric Ervin, Project Manager, Ste. Genevieve Plant, dated February 11, 2003 entitled "*General Status and Follow-up to February 7, 2003 Meeting*"
- Letter from Eric Ervin, Project Manager, to Randy E. Raymond, Permit Section Chief, dated February 18, 2003 entitled "*Holcim (US) Inc., Lee Island Facility – Innovative Control Technology Protocol*"
    - Supplemental letter from Eric Ervin, Project Manager, to Steve Jaques, Environmental Engineer, dated April 15, 2003 entitled "*Holcim (US) Inc., Lee Island Facility – Innovative Control Technology Protocol*"
- Memorandum from Dawn Froning, through Jeffry Bennett, to Steve Jaques dated May 16, 2003 entitled "*Ambient Air Quality Impact Analysis (AAQIA) for Holcim, Inc. – Ste. Genevieve County, Missouri Prevention of Significant Deterioration (PSD) Modeling*"
    - First revision August 7, 2003
    - Second revision December 16, 2003
- Letter from Eric L. Ervin, Project Manager, to Bud Rolofson, Meteorologist, USDI-U.S. Fish & Wildlife Services, dated July 28, 2003 and entitled "*Holcim (US) Inc. – Lee Island Project – Class I Area Report*".
- "*Estimated Impacts of the Proposed Holcim (US) Inc. Lee island Cement Plant on Air Quality and Air Quality Related Values at Nearby Class I Areas*", submittal dated July 28, 2003.
    - Class I Addendum No. 1 dated September 25, 2003
    - Class I Addendum No. 2, dated December 16, 2003 and Revised Addendum No. 2, dated January 6, 2004.
- "*Best Available Control Technology Analysis Update - Selective Catalytic Reduction*" Volumes I & II, submittal dated December 18, 2003.

- Memorandum from Jeffry D. Bennett, Air Quality Modeling Unit Chief, through Calvin Ku, Technical Support Section Chief, to Randy E. Raymond, Environmental Engineer, dated January 14, 2004 entitled "*Photochemical Evaluation of Holcim – Lee Island Summary*".
- Letter from Eric L. Ervin, Project Manager, to Kyra Moore, New Source Review Unit Chief, dated February 2, 2004 and entitled "*Holcim (US) Inc. – Lee Island Project – Additional Comments on Preliminary Draft Permit*".
- Memorandum from Dawn Froning to Kyra Moore, through Jeffry D. Bennett, P.E., entitled, "*Class I Ambient Air Quality Impact Analysis (AAQIA) for Holcim (US), Inc.- Lee Island Project-December 2003 and January 2004 Submittals*" dated February 5, 2004.
- Letter from Dawn Froning, Environmental Specialist III, to Eric Ervin, Holcim (US), Inc., dated February 10, 2004 regarding the Class II CALPUFF analysis and protocol approval.
- Memorandum from Dawn Froning to Kyra Moore, through Jeffry D. Bennett, P.E., entitled, "*Revised Sulfur Dioxide (SO_2) Ambient Air Quality Impact Analysis (AAQIA) for Holcim (US), Inc.*" dated May 26, 2004.

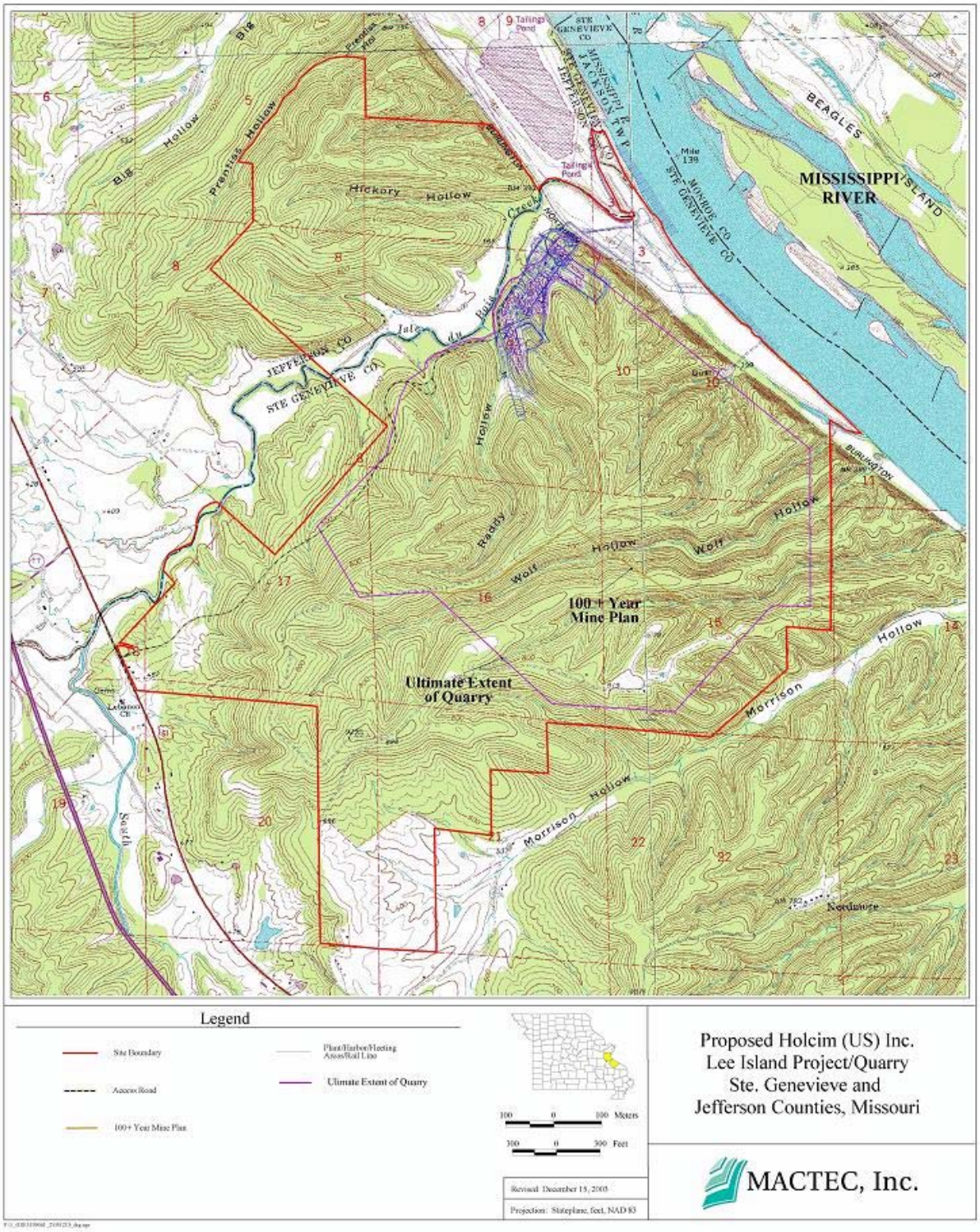

Figure 1.
Holcim – 3,916 acres
Lee Island Site (the top of the map is north)
Jefferson & Ste. Genevieve Counties

Table 1.				
Fabric Filter Listing				
EP	**EU**	**Description**	**DC-#**	**Stack ID**
6	1	Gyratory Crusher	1	1
	2	Bin/Feeder	1	1
7	1	Limestone Screening	3	3
	2	Transfer Point	3	3
	3	Transfer Point	3	3
8	1	Storage Bin	2	2
	2	Cone Crusher 1	2	2
	3	Cone Crusher 2	2	2
9	1	Conveyor Transfer Point	4	4
10	1	Conveyor Transfer Point	7	7
12	1	Conveyor Transfer Point	14	14
19	1	Rail Unloading	13	13
20	1	Conveyor Transfer Point	8	8
24	1	Conveyor Transfer Point	18	18
25	1	Conveyor Transfer Point	19	19
26	1	Conveyor Transfer Point	16	16
27	1	Conveyor Transfer Point	15	15
32	1	Silo Weigh Belt/Feeder	17	17
	2	Silo Weigh Belt/Feeder	17	17
36	1	Fly Ash Transfer	20	20
	2	Fly Ash Storage Silo	20	20
37	1	Conveyor Transfer Point	22	22
	2	Storage Bin	22	22
38	1	Feeder Transfer Point	23	23
	2	Conveyor Transfer Point	23	23
	3	Bucket Elevator	23	23
39	1	Feeder Transfer Point	24	24
	2	Conveyor Transfer Point	24	24
	3	Bucket Elevator	24	24
40	1	Conveyor Transfer Point	25	25
	2	Reject Bin	25	25
42	1	Air Slide Conveyor	28	C4
	2	Bucket Elevator	28	C4
43	1	Air Slide Conveyor	29	C4
	2	Bucket Elevator	29	C4
44	1	Air Slide Conveyors	30	C4
45	1	Air Slide Conveyor	32	C4
	2	Homogenization Silo	32	C4

Table 1.				
Fabric Filter Listing				
EP	**EU**	**Description**	**DC-#**	**Stack ID**
46	1	Air Slide Conveyor	33	C4
	2	Homogenization Silo	33	C4
47	1	Air Slide Conveyors/Hopper	34	C4
	2	Air Slide Conveyors	34	C4
48	1	Air Slide Conveyors/Hopper	35	C4
	2	Air Slide Conveyors	35	C4
49	1a	In-line Kiln/Raw Mill System (Filterable, First 2 Years)	A,B	AB
		In-line Kiln/Raw Mill System (Condensable, First 2 Years)	A,B	AB
	1b	In-line Kiln/Raw Mill System (Filterable)	A,B	AB
		In-line Kiln/Raw Mill System (Condensable)	A,B	AB
50	1	Clinker Cooler	C	C
		Clinker Cooler (Condensables)	C	C
51	1	Clinker Transfer	36	36
52	1	Conveyor Transfer Point	38	C1
	2	Reject Clinker Bin	38	C1
54	1	Conveyor Transfer Point	37	C1
55	1	Conveyor Transfer Point	40	C1
	2	Clinker Silo	40	C1
56	1	Conveyor Transfer Point	39	C1
	2	Clinker Silo	39	C1
57	1	Conveyor Transfer Point	41	C1
58	1	Silo Loadout/Clinker Transfer	42	C1
59	1	Silo Loadout/Clinker Transfer	43	C1
60	1	Silo Loadout/Clinker Transfer	44	C1
61	1	Silo Loadout/Clinker Transfer	45	C1
62	1	Conveyor Transfer Point	50	C2
	2	Conveyor Transfer Point	50	C2
	3	Gypsum Silo	50	C2
63	1	Conveyor Transfer Point	53	C5
	2	Gypsum Silo	53	C5
64	1	Conveyor Transfer Point	51	C2
	2	Gypsum Silo	51	C2
65	1	Conveyor Transfer Point	52	C5
	2	Gypsum Silo	52	C5
66	1	Feeder Transfer Point	46	C2
67	1	Feeder Transfer Point	47	C2
68	1	Feeder Transfer Point	48	C5

Table 1.				
Fabric Filter Listing				
EP	**EU**	**Description**	**DC-#**	**Stack ID**
69	1	Feeder Transfer Point	49	C5
70	1	Conveyor Transfer Point	54	54
	2	Reject Bin	54	54
	3	Bucket Elevator	54	54
72	1	Conveyor Transfer Point	56	56
	2	Reject Bin	56	56
	3	Bucket Elevator	56	56
74	1	Finish Mill 1	E	EF
	2	Auxiliary Heater 1	E	EF
	3	Finish Mill 2	F	EF
	4	Auxiliary Heater 2	F	EF
75	1	Conveyor Transfer Point	58	58
	2	Reject Bin	58	58
	3	Bucket Elevator	58	58
77	1	Conveyor Transfer Point	60	60
	2	Reject Bin	60	60
	3	Bucket Elevator	60	60
79	1	Finish Mill 3	G	GH
	2	Auxiliary Heater 3	G	GH
	3	Finish Mill 4	H	GH
	4	Auxiliary Heater 4	H	GH
80	1	Air Slide Conveyor	62	C3
	2	Air Slide Conveyor	62	C3
	3	Bucket Elevator	62	C3
	4	Bucket Elevator	62	C3
81	1	Bucket Elevator	63	C3
	2	Bucket Elevator	63	C3
	3	Air Slide Conveyor	63	C3
	4	Cement Storage (Silos 1-4, Interstice)	63	C3
82	1	Air Slide Conveyor	64	C3
	2	Cement Storage (Silos 5-8, Interstice)	64	C3
83	1	Silo Loadout/Cement Transfer	65	C3
84	1	Silo Loadout/Cement Transfer	66	C3
85	1	Silo Loadout/Cement Transfer	67	C3
86	1	Silo Loadout/Cement Transfer	68	C3
87	1	Silo Loadout/Cement Transfer	69	C3
88	1	Silo Loadout/Cement Transfer	70	C3
89	1	Silo Loadout/Cement Transfer	71	C3
90	1	Silo Loadout/Cement Transfer	72	C3
91	1	Cement Truck Loadout #1	73	C3
92	1	Cement Truck Loadout #2	74	C3

Table 1.
Fabric Filter Listing

EP	EU	Description	DC-#	Stack ID
93	1	Cement Truck Loadout #3	75	C3
94	1	Cement Transfer	76	C3
95	1	Bucket Elevator	78	C3
96	1	Cement Transfer	77	C3
97	1	Bucket Elevator	79	C3
98	1	Air Slide Conveyor	80	C6
	2	Bucket Elevator	80	C6
99	1	Air Slide Conveyor	81	C6
	2	Bucket Elevator	81	C6
100	1	Air Slide Conveyor/Cement Silo	82	82
101	1	Air Slide Conveyor/Cement Silo	83	83
102	1	Air Slide Conveyors/Bucket Elevator	84	84
103	1	Air Slide Conveyors/Bucket Elevator	85	85
104	1	Cement Rail Loadout	86	86
105	1	Cement Barge Loadout #1	87	87
106	1	Cement Barge Loadout #2	88	88
107	1	Cement Barge Loadout #3	89	89
108	1	Cement Barge Loadout #4	90	90
115	1a	Coal Mill (Filterable, First 2 Years)	D	D
		Coal Mill (Condensable, First 2 Years)	D	D
	1b	Coal Mill (Filterable)	D	D
		Coal Mill (Condensable)	D	D
116	1	Pneumatic Pump	91	91
117	1	Hopper	92	92
118	1	Hopper	93	93

Table 2.
Enclosure Listing

EP	EU	Description
11	1	Stacker Conveyor
	2	Limestone Storage Dome
	3	Reclaim Conveyor
	4	Transfer Point
14	1	Material Transfer
15	1	Material Transfer
16	1	Conveyor Transfer Point
17	1	Conveyor Transfer Point

Table 2.
Enclosure Listing

EP	EU	Description
21	1	Conveyor Transfer Point
22	1	Conveyor Transfer Point
23	1	Trip Conveyor
	2	Stacker Conveyor
	3	Additives Storage
	4	Reclaim Conveyor
	5	Conveyor Transfer Point
	6	Gypsum Unloading
	7	Front End Loader - Pile Maintenance
	8	Gypsum Transfer
	9	Gypsum Transfer
	10	Gypsum Storage
	11	Feeder Transfer Point
28	1	Conveyor Transfer Point
29	1	Conveyor Transfer Point
30	1	Conveyor Transfer Point
31	1	Conveyor Transfer Point
33	1	Silo Weigh Belt/Feeder
34	1	Silo Weigh Belt/Feeder
35	1	Silo Weigh Belt/Feeder
109	1	Conveyor Transfer Point
110	1	Trip Conveyor
	2	Stacker Conveyor
	3	Coal/Coke Storage
	4	Reclaim Conveyor
	5	Conveyor Transfer Point
111	1	Conveyor Transfer Point
112	1	Conveyor Transfer Point
	2	Storage Bin
	3	Storage Bin
113	1	Feeder Transfer Point
114	1	Feeder Transfer Point

Table 3
Holcim (US) Inc. – Lee Island
Applicability Table

EP	EU	Description	BACT						NSPS			NESHAP	State Rules		
			PM_{10}	SO_2	NO_x	VOC	CO	Pb	Kb	Y	OOO	LLL	6.220	6.260	6.400
1	1	Segments 1-5 (Gypsum Delivery Traffic)	X										X[1]		
	2	Segments 6-10 (Cement Loadout Traffic)													
	3	Segments 11-20 (General Traffic)													
	4	Segment 21 (Flyash Delivery Traffic)													
	5	Segments 22-78 (General Traffic)													
		Plant Access Road Total													
2	1	Limestone Drilling (West Quarry)											X[1]		
	2	Limestone Drilling (East Quarry)													
3	1	Limestone Truck Loading (West Quarry)											X[1]		
	2	Limestone Truck Loading (East Quarry)													
4	1	Segments 1-7 (All Traffic)	X										X[1]		
	2	Segments 8-14 (East Quarry Traffic)													
	3	Segments 15-21 (West Quarry Traffic)													
		Quarry Haul Road Total													
5	1	Limestone Truck Unloading	X												X
6	1	Gyratory Crusher	X								X				
	2	Bin/Feeder													
7	1	Limestone Screening	X								X				
	2	Transfer Point													
	3	Transfer Point													

Table 3
Holcim (US) Inc. – Lee Island
Applicability Table

EP	EU	Description	BACT						NSPS			NESHAP	State Rules		
			PM_{10}	SO_2	NO_x	VOC	CO	Pb	Kb	Y	OOO	LLL	6.220	6.260	6.400
8	1	Storage Bin	X								X				
	2	Cone Crusher 1													
	3	Cone Crusher 2													
9	1	Conveyor Transfer Point	X								X				
10	1	Conveyor Transfer Point	X								X				
11	1	Stacker Conveyor	X								X				
	2	Limestone Storage Dome									X				
	3	Reclaim Conveyor										X	X		X
	4	Transfer Point										X	X		X
12	1	Conveyor Transfer Point	X									X	X		
13	1	Barge Unloading	X								X [2]		X [3]		
14	1	Material Transfer	X								X [2]		X [3]		
15	1	Material Transfer	X								X [2]		X [3]		
16	1	Conveyor Transfer Point	X								X [2]		X [3]		
17	1	Conveyor Transfer Point	X								X [2]		X [3]		
18	1	Truck Unloading	X										X [4]		
19	1	Rail Unloading	X								X [2]		X [3]		X [5]
20	1	Conveyor Transfer Point	X								X [2]		X [3]		
21	1	Conveyor Transfer Point	X								X [2]		X [3]		
22	1	Conveyor Transfer Point	X								X [2]		X [3]		
23	1	Trip Conveyor	X								X [2]		X [3]		
	2	Stacker Conveyor									X [2]		X [3]		
	3	Additives Storage									X [2]				
	4	Reclaim Conveyor										X	X		
	5	Conveyor Transfer Point										X	X		
	6	Gypsum Unloading													
	7	Front End Loader - Pile											X		X

Table 3
Holcim (US) Inc. – Lee Island
Applicability Table

EP	EU	Description	BACT						NSPS			NESHAP	State Rules		
			PM_{10}	SO_2	NO_x	VOC	CO	Pb	Kb	Y	OOO	LLL	6.220	6.260	6.400
		Maintenance													
	8	Gypsum Transfer										X	X		
	9	Gypsum Transfer										X	X		
	10	Gypsum Storage										X	X		
	11	Feeder Transfer Point										X	X		
24	1	Conveyor Transfer Point	X									X	X		
25	1	Conveyor Transfer Point	X									X	X		
26	1	Conveyor Transfer Point	X									X	X		
27	1	Conveyor Transfer Point	X									X	X		
28	1	Conveyor Transfer Point	X									X	X		
29	1	Conveyor Transfer Point	X									X	X		
30	1	Conveyor Transfer Point	X									X	X		
31	1	Conveyor Transfer Point	X									X	X		
32	1	Silo Weigh Belt/Feeder	X									X	X		X
	2	Silo Weigh Belt/Feeder													
33	1	Silo Weigh Belt/Feeder	X									X	X		
34	1	Silo Weigh Belt/Feeder	X									X	X		
35	1	Silo Weigh Belt/Feeder	X									X	X		
36	1	Fly Ash Transfer	X									X	X		X
	2	Fly Ash Storage Silo													
37	1	Conveyor Transfer Point	X									X	X		
	2	Storage Bin													
38	1	Feeder Transfer Point	X									X	X		
	2	Conveyor Transfer Point													
	3	Bucket Elevator													

Table 3
Holcim (US) Inc. – Lee Island
Applicability Table

EP	EU	Description	BACT						NSPS			NESHAP	State Rules		
			PM_{10}	SO_2	NO_x	VOC	CO	Pb	Kb	Y	OOO	LLL	6.220	6.260	6.400
39	1 2 3	Feeder Transfer Point Conveyor Transfer Point Bucket Elevator	X									X	X		
40	1 2	Conveyor Transfer Point Reject Bin	X									X	X		
41	1	Reject Bin Unloading										X	X		
42	1 2	Air Slide Conveyor Bucket Elevator	X									X	X		
43	1 2	Air Slide Conveyor Bucket Elevator	X									X	X		
44	1	Air Slide Conveyors	X									X	X		X
45	1 2	Air Slide Conveyor Homogenization Silo	X									X	X		
46	1 2	Air Slide Conveyor Homogenization Silo	X									X	X		
47	1 2	Air Slide Conveyors/Hopper Air Slide Conveyors	X									X	X		
48	1 2	Air Slide Conveyors/Hopper Air Slide Conveyors	X									X	X		
		Dust Collectors #28-30, 32-35													
49	1a 1b	In-line Kiln/Raw Mill System (Filt, First 2 Yrs) In-line Kiln/Raw Mill System (Cond, First 2 Yrs) In-line Kiln/Raw Mill System (Filt) In-line Kiln/Raw Mill System (Cond)	X	X	X	X	X					X	X	X	X
50	1	Clinker Cooler	X									X	X		X

Table 3
Holcim (US) Inc. – Lee Island
Applicability Table

EP	EU	Description	BACT						NSPS			NESHAP	State Rules		
			PM_{10}	SO_2	NO_x	VOC	CO	Pb	Kb	Y	OOO	LLL	6.220	6.260	6.400
		Clinker Cooler (Cond)													
51	1	Clinker Transfer	X									X	X		
52	1 2	Conveyor Transfer Point Reject Clinker Bin	X									X	X		
53	1	Reject Bin Loadout										X	X		
54	1	Conveyor Transfer Point	X									X	X		
55	1 2	Conveyor Transfer Point Clinker Silo	X									X	X		
56	1 2	Conveyor Transfer Point Clinker Silo	X									X	X		
57	1	Conveyor Transfer Point	X									X	X		
58	1	Silo Loadout/Clinker Transfer	X									X	X		
59	1	Silo Loadout/Clinker Transfer	X									X	X		
60	1	Silo Loadout/Clinker Transfer	X									X	X		
61	1	Silo Loadout/Clinker Transfer	X									X	X		
		Dust Collectors #37-45													
62	1 2 3	Conveyor Transfer Point Conveyor Transfer Point Gypsum Silo	X									X	X		
63	1 2	Conveyor Transfer Point Gypsum Silo	X									X	X		
64	1 2	Conveyor Transfer Point Gypsum Silo	X									X	X		
65	1 2	Conveyor Transfer Point Gypsum Silo	X									X	X		
66	1	Feeder Transfer Point	X									X	X		
67	1	Feeder Transfer Point	X									X	X		

Table 3
Holcim (US) Inc. – Lee Island
Applicability Table

EP	EU	Description	BACT						NSPS			NESHAP	State Rules		
			PM_{10}	SO_2	NO_x	VOC	CO	Pb	Kb	Y	OOO	LLL	6.220	6.260	6.400
		Dust Collectors #46, 47, 50, 51													
68	1	Feeder Transfer Point	X									X	X		
69	1	Feeder Transfer Point	X									X	X		
		Dust Collectors #48, 49, 52, 53													
70	1 2 3	Conveyor Transfer Point Reject Bin Bucket Elevator	X									X	X		
71	1	Reject Bin Loadout										X	X		
72	1 2 3	Conveyor Transfer Point Reject Bin Bucket Elevator	X									X	X		
73	1	Reject Bin Loadout										X	X		
74	1 2 3 4	Finish Mill 1 Auxillary Heater 1 Finish Mill 2 Auxillary Heater 2	X	X	X	X	X					X	X	X	X
75	1 2 3	Conveyor Transfer Point Reject Bin Bucket Elevator	X									X	X		
76	1	Reject Bin Loadout										X	X		
77	1 2 3	Conveyor Transfer Point Reject Bin Bucket Elevator	X									X	X		
78	1	Reject Bin Loadout										X	X		
79	1 2 3	Finish Mill 3 Auxillary Heater 3 Finish Mill 4	X	X	X	X	X					X	X	X	X

Table 3
Holcim (US) Inc. – Lee Island
Applicability Table

EP	EU	Description	BACT						NSPS			NESHAP	State Rules		
			PM_{10}	SO_2	NO_x	VOC	CO	Pb	Kb	Y	OOO	LLL	6.220	6.260	6.400
	4	Auxillary Heater 4													
80	1 2 3 4	Air Slide Conveyor Air Slide Conveyor Bucket Elevator Bucket Elevator	X									X	X		X
81	1 2 3 4	Bucket Elevator Bucket Elevator Air Slide Conveyor Cement Storage (Silos 1-4, Interstice)	X									X	X		X
82	1 2	Air Slide Conveyor Cement Storage (Silos 5-8, Interstice)	X									X	X		X
83	1	Silo Loadout/Cement Transfer	X									X	X		
84	1	Silo Loadout/Cement Transfer	X									X	X		
85	1	Silo Loadout/Cement Transfer	X									X	X		
86	1	Silo Loadout/Cement Transfer	X									X	X		
87	1	Silo Loadout/Cement Transfer	X									X	X		
88	1	Silo Loadout/Cement Transfer	X									X	X		
89	1	Silo Loadout/Cement Transfer	X									X	X		
90	1	Silo Loadout/Cement Transfer	X									X	X		
91	1	Cement Truck Loadout #1	X									X	X		
92	1	Cement Truck Loadout #2	X									X	X		
93	1	Cement Truck Loadout #3	X									X	X		
94	1	Cement Transfer	X									X	X		
95	1	Bucket Elevator	X									X	X		
96	1	Cement Transfer	X									X	X		

Table 3
Holcim (US) Inc. – Lee Island
Applicability Table

EP	EU	Description	BACT						NSPS			NESHAP	State Rules		
			PM_{10}	SO_2	NO_x	VOC	CO	Pb	Kb	Y	OOO	LLL	6.220	6.260	6.400
97	1	Bucket Elevator	X									X	X		
		Dust Collectors #62-79													
98	1 2	Air Slide Conveyor Bucket Elevator	X									X	X		X
99	1 2	Air Slide Conveyor Bucket Elevator	X									X	X		X
		Dust Collectors #80, 81													
100	1	Air Slide Conveyor/Cement Silo	X									X	X		
101	1	Air Slide Conveyor/Cement Silo	X									X	X		
102	1	Air Slide Conveyors/Bucket Elevator	X									X	X		
103	1	Air Slide Conveyors/Bucket Elevator	X									X	X		
104	1	Cement Rail Loadout	X									X	X		
105	1	Cement Barge Loadout #1	X									X	X		
106	1	Cement Barge Loadout #2	X									X	X		
107	1	Cement Barge Loadout #3	X									X	X		
108	1	Cement Barge Loadout #4	X									X	X		
109	1	Conveyor Transfer Point	X												
110	1 2 3 4 5	Trip Conveyor Stacker Conveyor Coal/Coke Storage Reclaim Conveyor Conveyor Transfer Point	X							X					
111	1	Conveyor Transfer Point	X												
112	1 2	Conveyor Transfer Point Storage Bin	X							X					

Table 3
Holcim (US) Inc. – Lee Island
Applicability Table

EP	EU	Description	BACT						NSPS			NESHAP	State Rules		
			PM_{10}	SO_2	NO_x	VOC	CO	Pb	Kb	Y	OOO	LLL	6.220	6.260	6.400
	3	Storage Bin													
113	1	Feeder Transfer Point	X							X					
114	1	Feeder Transfer Point	X							X					
115	1a 1b	Coal Mill (Filt, First 2 Yrs) Coal Mill (Cond, First 2 Yrs) Coal Mill (Filt) Coal Mill (Cond)	X	X	X	X	X			X			X	X	X
116	1	Pneumatic Pump	X									X	X		
117	1	Hopper	X									X	X		
118	1	Hopper	X									X	X		
119	1	Alternative Fuel Tank #1							X						
120	1	Alternative Fuel Tank #2							X						
121	1	Alternative Fuel Tank #3							X						

1 Historically, 10 CSR 10-6.220 has not applied to fugitive sources. However, fugitive sources are no longer expressly exempt from this regulation.

2 40 CFR Part 60, Subpart OOO is only applicable when non-metallic minerals are being processed in these sources.

3 10 CSR 10-6.220 is only applicable when these sources are not subject to the requirements of 40 CFR Part 60.

4 10 CSR 10-6.220 is only applicable when this source is not subject 40 CFR Part 60, Subpart OOO, when not processing non-metallic minerals.

5 10 CSR 10-6.400 is only applicable when this source is not subject to the requirements of 40 CFR Part 60.

Attachment A - Compliance Worksheet

Following is an example compliance calculation sheet. An alternative compliance calculation sheet may be used instead of this example provided Holcim receives written approval for the alternative from the department.

Column 1	2	3	4	5	6	7	8	9
Month	Hours Operated[65]	Hours Operated[66]	SO_2 [67]	SO_2 [68]	Clinker [69]	Clinker [70]	SO_2 [71]	SO_2 [72]
January- 2005								
February- 2005								
March- 2005								
April- 2005								
May- 2005								
June- 2005								
July- 2005								
August- 2005								
September- 2005								
October- 2005								
November- 2005								
December- 2005								

[65] The number of hours the kiln system operated to produce the clinker for the month recorded in column 6.
[66] The sum of the hours the kiln system operated to produce the clinker for the recent 12-months recorded in column 7.
[67] Pounds per hour averaged for the month
[68] Pounds per hour averaged for the recent 12-months
[69] Tons of clinker produced in the month
[70] Tons of clinker produced in the recent 12-months
[71] Pounds of SO_2 per ton of clinker averaged for the month. The result of column 4 multiplied by column 2 (there may be a better, more direct calculation of total pounds emitted during a certain period, depending on the monitoring device), divided by column 6.
[72] Pounds of SO_2 per ton of clinker averaged for the most recent 12-months. The result of column 5 multiplied by column 3, divided by column 7.

Appendix A - List of Acronyms

AAL	Ambient Air Level
AAQIA	Ambient Air Quality Impact Analysis
ACBM	Asbestos-Containing Building Material
ACFM	Actual Cubic Feet Per Minute
ACS	American Chemical Society
ACM	Asbestos-Containing Material
ADI	Acceptable Daily Intake
AEL	Alternate Emissions Limit
AGO	Attorney General's Office
AHERA	Asbestos Hazard Emergency Response Act (Federal)
AL	Acceptable Level
ALPD	Air and Land Protection Division
AMS	American Meteorological Society
APCP	Air Pollution Control Program
API	American Petroleum Institute
AQCR	Air Quality Control Region
AQMA	Air Quality Maintenance Area
AQSM	Air Quality Simulation Model
ARRP	Acid Rain Research Program
AS	Area Source
ASC	Area Source Category
ASMDHS	Airshed Model Data Handling System
ATERIS	Air Toxics Exposure and Risk Information System
BACT	Best Available Control Technology
BID	Background Information Document
BP	Boiling Point
BTU	British Thermal Unit
C	Celsius
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAM	Compliance Assurance Monitoring
CAP	Criteria Air Pollutant
CAS	Chemical Abstract Service
CDD	Chlorinated Dibenzo-p-Dioxin
CDF	Chlorinated Dibenzofuran
CE	Control Efficiency
CEM	Continuous Emission Monitoring
CEMS	Continuous Emission Monitoring System
CEO	Chief Executive Officer
CFC	Chlorofluorocarbon
CFR	Code of Federal Regulations
CFS	Cubic Feet per Second
Cl_2	Chlorine
CO	Carbon Monoxide
COH	Coefficient of Haze

COM	Continuous Opacity Monitoring
CPVC	Chlorinated Polyvinyl Chloride
CSR	Code of State Regulations
CTG	Control Techniques Guideline
$DAVG_{VW}$	Daily Volume-Weighted Average
DNR	Department of Natural Resources
DRE	Destruction and Removal Efficiency
DSCF	Dry Standard Cubic Foot
DSCM	Dry Standard Cubic Meter
EAP	Environmental Action Plan
ED	Effective Dose
EDB	Ethylene Dibromide
EDC	Ethylene Dichloride
EER	Excess Emissions Report
EF	Emission Factor
EI	Emission Inventory
EIS	Emission Inventory Subsystem
EIQ	Emission Inventory Questionnaire
E-MAIL	Electronic Mail
EO	Ethylene Oxide
EP	Emission point
EPA	U.S. Environmental Protection Agency
ERC	Emissions Reduction Credit, as defined by 10 CSR 10-6.410.
ESH	Environmental Safety and Health
ESP	Electrostatic Precipitator
ET	Emissions Trading
EU	Emission unit
F	Fahrenheit
FE	Fugitive Emissions
FESOP	Federally Enforceable State Operating Permit
FGD	Flue-Gas Desulfurization
FID	Flame Ionization Detector
FIP	Federal Implementation Plan
FLM	Federal Land Manager
FLP	Flash Point
FR	Federal Register
FY	Fiscal Year
GC	Gas Chromatograph
GC/MS	Gas Chromatograph/Mass Spectrograph
GCG	Gas-Condensate-Glycol
GLC	Gas Liquid Chromatography
GPG	Grams per Gallon
GR/DSCF	Grains per Dry Standard Cubic Foot
HAP	Hazardous Air Pollutant

HAZMAT	Hazardous Material
HC	Hydrocarbons
HCFC	Hydrochlorofluorocarbon
HCl	Hydrogen Chloride
HFC	Hydrofluorcarbons
HI-VOL	Hi Volume Sampler
HON	Hazardous Organic NESHAP
HP	Horse Power
HPLC	High Performance Liquid Chromatography
HW	Hazardous Waste
HWI	Hazardous Waste Incinerator
ICAP	Inductively Coupled Argon Plasma
ICP	Inductively Coupled Plasma
ID	Inside Diameter
IP	Inhalable Particulate
IPM	Inhalable Particulate Matter
IR	Infrared
ISO	International Organization for Standardization
JCRO	Department's Jefferson City Regional Office
K	Kelvin (Temperature)
KCRO	Department's Kansas City Regional Office
KW	Kilowatt
KWH	Kilowatt Hour
LAER	Lowest Achievable Emission Rate
LC	Liquid Chromatography
LDAR	Leak Detection and Repair
LEL	Lower Explosive Limit
LIMB	Limestone-Injection, Multi-Stage Burner
LPG	Liquefied Petroleum Gas
LST	Low-Solvent Technology
LUST	Leaking Underground Storage Tank(s)
MACC	Missouri Air Conservation Commission
MACT	Maximum Achievable Control Technology
MAER	Maximum Allowable Emission Rate
MDNR	Missouri Department of Natural Resources
MEK	Methyl Ethyl Ketone
MGD	Million Gallons per Day
MH	Man Hours
MIBK	Methyl Isobutyl Ketone
MIC	Methyl Isocyanate
MM BTU	Million British Thermal Unit
MMT	Million Metric Tons
MP	Melting Point
MS	Mass Spectrometry

MSDS	Material Safety Data Sheet
MSW	Municipal Solid Waste
MTBE	Methyl Tertiary Butyl Ether
MW	Megawatt
MW	Molecular Weight
MWC	Municipal Waste Combustor
MWe	Megawatts electricity
MWI	Medical Waste Incinerator
NA	Non-Attainment
NAA	Non-Attainment Area
NAAQS	National Ambient Air Quality Standard
NAS	National Academy of Science
NATICH	National Air Toxics information Clearinghouse
NBS	National Bureau of Standards
NDIR	Non-dispersive Infrared Analysis
NEPA	National Environmental Policy Act
NERO	Department's Northeast Regional Office
NESHAP	National Emission Standards for Hazardous Air Pollutants
NIOSH	National Institute of Occupational Safety and Health
NMHC	Non-methane Hydrocarbons
NMOC	Non-methane Organic Compound
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NOAA	National Oceanic and Atmospheric Administration
NOV	Notice of Violation
NSPS	New Source Performance Standards
NSR	New Source Review
NTIS	National Technical Information Service
O_2	Oxygen
O_3	Ozone
OD	Outside Diameter
OEM	Original Equipment Manufacturer
OSHA	Occupational Safety and Health Administration
OVA	Organic Vapor Analyzer
PAH	Polycyclic Aromatic Hydrocarbon
PAL	Plant-wide Applicability Level
PAN	Peroxyacetyl Nitrate
Pb	Lead
PCB	Polychlorinated Biphenyl
PCMACT	40 CFR 63 Subpart LLL, *National Emission Standards for the Portland Cement Manufacturing Industry*
PEMS	Predictive Emission Monitoring System
PERC	Perchloroethylene
PET	Polyethylene Terephthalate
PIC	Products of Incomplete Combustion

PM	Particulate Matter
PM_{10}	Particulate Matter less than 10 microns
POM	Particulate Organic Matter
POM	Polycylic Organic matter
PPB	Parts Per Billion
PPM	Parts Per Million
PPMV	Parts Per Million by Volume
PPT	Parts Per Trillion
PPTH	Parts Per Thousand
PS	Point Source
PSAM	Point Source Ambient Monitoring
PSD	Prevention of Significant Deterioration
PSI	pounds per square inch
PTE	Potential To Emit
PVC	Polyvinyl Chloride
QA	Quality Assurance
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QC	Quality Control
R&D	Research and Development
RA	Risk Assessment
RACT	Reasonably Available Control Technology
RDF	Refuse-Derived Fuel
RMP	Risk Management Plan
RPM	Revolutions per Minute
RSMo	Revised Statutes of Missouri
RTP	Research Triangle Park
RVP	Reid Vapor Pressure
SCFM	Standard Cubic Feet per Minute
SCR	Selective Catalytic Reduction
SD	Standard Deviation
SERO	Southeast Regional Office
SI	International System of Units
SIC	Standard Industrial Code
SIMS	Secondary Ion-Mass Spectometry
SIP	State Implementation Plan
SLRO	Department's St. Louis Regional Office
SMSA	Standard Metropolitan Statistical Area
SNCR	Selective Non-Catalytic Reduction
SO_2	Sulfur Dioxide
SO_X	Sulfur Oxide
SOC	Synthetic Organic Chemicals
SOCMI	Synthetic Organic Chemical Manufacturing Industry
SOP	Standard Operating Procedure
SR	Stoichiometric Ratio
SRM	Standard Reference Materials

STEL	Short-Term Exposure Limit
STP	Standard Temperature and Pressure
SWRO	Department's Southwest Regional Office
TCRI	Toxics Chemical Release Inventory
TDL	Tunable Diode Laser
TEG	Triethylene Glycol
THC	Total Hydrocarbons
TLV	Threshold Limit Value
TOA	Trace Organic Analysis
TOC	Total Organic Compound
TPY	Tons Per Year
TQ	Threshold Quantity
TRI	Toxic Release Inventory
TS	Toxic Substances
TSP	Total Suspended Particulate
TSS	Total Suspended (non-filterable) Solids
UAM	Urban Airshed Model
UEL	Upper Explosive Limit
USEPA	United States Environmental Protection Agency
UV	Ultraviolet
VCM	Vinyl Chloride Monomer
VE	Visible Emissions
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
VOHAP	Volatile Organic HAP
VP	Vapor Pressure
VSS	Volatile Suspended Solids